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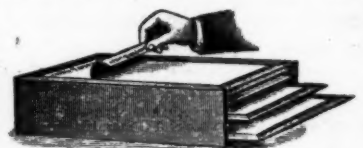


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The business department of THE JOURNAL is on page 206.

All letters relating to contributions should be addressed plainly, "Editors of SCHOOL JOURNAL." All letters about subscriptions should be addressed to E. L. Kellogg & Co. Do not put editorial and business items on the same sheet.



PROPERLY formed sentence is a thought; we think in sentences; we think as we express ourselves and no farther. If a person says, "I know but cannot state it," you are sure he does not know—unless he is confused, embarrassed, etc. A dog can do little thinking because he has little language; if he could learn to speak he could become, as far as we know, as good a thinker as a man; the difference lies in the language.

The teacher must know the foundation on which he attempts to build new knowledge. He must know the condition of the pupil's mind. He must know what the pupil knows. The pupil's known must be known to the teacher; it is only thus that he can go out into the unknown. No matter how skilfully the teacher may talk about a subject, if the pupil is ignorant of that subject, the time is wasted. Sometimes the once "known" has slipped away. The first rule is to see that there is a foundation.

The decision that Catholics may send their children to the public schools and no fault be found with them by their priests, will cause a great many to breathe more freely. The public schools have gained such a remarkable hold upon the public mind that parents desire to have their children attend them; they are a governmental institution like the postoffice.

It has not been denied that in Newark, N. J., the priests refuse to receive children who attended the public schools. The decision of Ablegate Satolli declares that all these children may attend the public schools and their action not be called in question. This is just; the right of a child to obtain an education is one that must not be abridged; it is almost a natural right. These remarks are made here because the press has been loaded for the past two months with comments on the decision referred to.

In the *Philadelphia Press*, of Feb. 13, the reports of several sermons on the Bible in public schools appear. One demanded that "children should be instructed so that they will appreciate fully that God exists and that Jesus came into the world and saved it."

Another said "the whole superstructure of our government is founded upon the Christian religion."

A school system that takes money from Jews, Protestants, and Catholics for its support must carry on that system so as to meet with the approval of all these contributors. Parents send their children to school for instruction; the school is not to do all things for

the child,—the parents reserve the right to give the child such specific religious instruction as they may choose. It has been again and again noted that clergymen sent their children to schools where the instruction was the most efficiently given, not to that one where the Bible was faithfully read.

It may be safely asserted that there cannot be instruction without some degree of education. Yet the truth remains, and ought to be thoroughly understood, that the degree of the educational result of instruction depends mainly on the method. It may be conceded that all teaching, has a certain educational force, and must communicate some result to the character; but of two modes of teaching the educative force of one may be tenfold that of the other. For instance, let two persons instruct different classes in the same subject, say, the shape of the earth; one shall so treat his subject as to require no more effort than is necessary to give a clear apprehension of it; the other shall so marshal his facts and his illustrations, that his class will reason out inductively the subject for themselves. In this case the mental effort would be greater, the pleasure more intense, and consequently the educational result much more, than in the other.

At a debate in Ohio on cooking, one speaker asked whether it was a fact that the best cooking was done in the country. This aroused nearly every one to give his opinion, as the question was a simple one. It was finally concluded that the best cooking was done by educated women—high school graduates, and college graduates. It has been asserted of late years with confidence that Vassar and Wellesley graduates are noted among their acquaintances for superior cooking; sometimes this reputation extends over a wide territory.

Cooking is by no means to be despised; it is a manual occupation that requires a well-trained mind; the better the mental training the better the cooking. Cooking is a paying occupation; a lady teacher who was paid \$60 per month found at an Adirondack hotel that the cooking was done by another lady who was paid \$75 per month and her board. After planning the supper she donned her best raiment and sat on the piazza with the guests.

In the *Educational Review* for September, Dr. Lewis G. Janes presents "An Agnostic View," of the question of religious teaching in the public schools, which it would be well for every handler of children to carefully read. In a masterly way he arrays the knowledge of God received through God's works, relieved of the kindly officiousness of human interpretation, against the man-conjured vision so uniformly pressed upon the children of the past. He shows how fallible, earthly hands can never fit a garment to an Infinite form forever beyond their touch.—*Interstate Review*.

One Recitation Period.

By PAUL R. KRUEGER.

Many teachers, especially those in the country schools, find that the time that can be given to each recitation is very short; and they consequently complain that therefore they cannot do satisfactory work. To remove this cause of complaint, it is necessary, first, to unite as many classes as possible into one class, and secondly, to have the pupils of a certain grade recite all their lessons during one period. The length of this period will, of course, depend upon the number of grades in the school. In country schools the number of grades need not be over four or six. Taking six grades, there will be fifty-five minutes in each school day of five and one-half hours for each of the six grades during which to recite all their lessons. Fifty-five minutes may still seem a short time in which a pupil is to recite all his lessons from three to seven in number; nevertheless, as it requires about one and one-half minutes to dismiss one class and call up another, there would be, in a school where there are now twenty recitations a day, a total saving of nearly one-half hour.

In addition to this advantage, the barriers that lie between the different branches would be broken down. The hands of the clock would no longer debar the teacher from having his class recite arithmetic, geography, history, physiology, grammar, and reading in logical connection. That these branches are logically connected, no one can doubt. Efforts to unite them in teaching have been made in arithmetic readers, geography readers, historical readers, and natural science readers. Now, if this is true, why not teach these branches in such a connection?

In the first place, the pupil will become more interested in the subjects and more thorough in the branches; in the second place, in the efforts to bind together isolated facts from every branch by logical cords, his faculties will gain fiber, and his knowledge will gain, according to the success of his efforts, more or less solidity. It is self-evident that the various branches cannot be taught in logical connection when a definite period of time is daily devoted to a certain branch exclusively, and when the periods of recitation in lessons logically the most closely connected are separated, as is often the case, by the span of an entire school day.

To this single long recitation period, however, the objection might be made that it is too long; and that consequently, toward the close of the recitation, the attention of the pupils would begin to flag. This objection will, however, not hold. The attention of the pupils not only will not flag, but on the contrary it will increase. But, of course, this is the case only when the teacher understands how to arrange the points of the lessons in such a manner as will lead to a climax at the close of the recitation. This is not so difficult to do as it may seem to the teacher who recalls his previous efforts in a single branch; but, nevertheless, to do it well requires somewhat of an artist. The true artist teacher, the teacher of genius, will succeed in the work; for he has full liberty to introduce where, when, and in whatever connection or manner he may see expedient whatever is in any manner connected with the subject under consideration; neither is he limited to a certain period of time in which to teach the facts of a certain branch; nor even is he compelled to teach a definite number of facts of a certain branch during every recitation; but he is governed only by his knowledge of the art of giving a beautiful symmetry to the child's knowledge. The liberty which gives him the opportunity to do this, the true teacher will justly appreciate and improve. Limited to no time, to no single subject, but only to the ideal product, he will rise to a full understanding and just appreciation of the dignity and possibility of his calling; and glorying in his strength and opportunity, he will accomplish great and good things.

Likewise the pupils taught by such a teacher, to whom greater liberty means only greater opportunities for more and better work, will enjoy a real pleasure in

connecting various facts gleaned from many various sources, and thereby evolving other and new facts. He will find stimulus in learning many geographical facts by means of the facts of arithmetic, which he already knows; of tracing historical facts to geographical facts and *vice versa*; of connecting historical, geographical, physiological, grammatical facts, and in representing all of them by means of written and spoken signs, which in turn are most intimately connected with physiological facts.

Confident of such results, the true teacher should acquire this liberty for himself and for his pupils. The teacher, however, who is not willing to plant his talent, his knowledge, his energy, and his heart into the work that by their decay new talent, new energy, and new hearts may be brought forth and nourished to power, had better not aspire to such liberty; for surely he will most woefully fail.

Every evening he should collect, arrange, and write out the lessons for the following day. His success in this task will determine to a great extent the success of his teaching and the success of his classes.

As to Definitions.

Just what children of a certain age should learn is not yet settled; but it is settled that young children, say those in the primary departments of schools should not learn formal definitions. For example: "An island is a body of land entirely surrounded by water," while entirely intelligible to an adult, is merely a collection of words to a child. This is true of most of the definitions that represent the bulk of what is termed knowledge.

The child is busy with the *what* for many years; the adult, for convenience, must arrange things in classes; he is busy with differences and likenesses. To aid the child who is seeking knowledge, and who must begin to arrange his knowledge, the teacher may point out likenesses and differences; for example, he may construct earth in the sand-table so as to exemplify an island, a cape, a promontory, a hill, a valley, etc. The pupil sees, what an island is. "Tell me about the island," says the teacher. "It is surrounded with water," says the child. If a sand-table cannot be obtained, a paper may be laid on the floor and the supposition made that it is surrounded with water.

Now, in these cases the pupil proceeds on the plan of obtaining his own knowledge and arranging it himself—which is nature's plan. To place before him the definition which some one else has made, and require him to learn it and recite it, is a quicker method—but it is a bad method.

It was considered an excellent thing once for young children to spell and define words. "Cobb's Speller and Definer" was once a popular book. A word was named to the pupil, as "able"; he spelled it, then defined it, as "competent, powerful, qualified." The book disappeared because it was felt that definitions were not the proper study for the child.

It was the custom (and is yet in many places) to require the pupil who begins arithmetic to learn a round dozen of definitions: "Arithmetic is the science and art of numbers," "A number is the representation of quantity," "Quantity is anything that can be measured," etc., etc. Having committed these to memory, the pupil next advanced to learning that "Addition is joining several numbers so as to find the entire sum." Then he was shown how to do a problem.

This plan is fast giving way to the rational one of showing a pupil how numbers are united, and then pointing out that "we call this addition."

The teacher will say, "But suppose the principal or superintendent comes in and asks what is addition and my pupils cannot answer." It may properly be said that your business as a teacher is not to prepare your class to answer all the questions that may be proposed to them. Do not be ashamed if they cannot reply; they are children; the committing to memory of definitions

made by some one else is not the proper work of children.

The day of definitions is doomed; it was the protest against definition learning that took grammar out of the grammar school. Millions of children have been required to learn that "a noun was the name of any person, place, or thing that can be known or mentioned." They might as well be required to learn that "a hat is a combination of wool, more often of shoddy, or shoddy and cotton, sometimes covered with silk and worn on the head."

The reason for the repudiation of committing to memory wordy definitions by children has come from a better comprehension of what a child can best do during the first ten years of life. As said at the outset this is not settled upon and will not be for many years to come. But it is settled that it is wholly inappropriate for a child to choke its memory with precise language statements, to verify which he might spend many years of his life.

"Bitzer, what is a horse?" Bitzer may be thought to give Cuvier's definition, but the man who requires him to do so is doing an unjust and an unrighteous thing. Bitzer is to have but a short childhood and have it but once. Is it the best thing one who has gone through childhood can do for Bitzer to make him learn Cuvier's definition of a horse? How many are calling out to-day, "Bitzer, what is a horse?" "Bitzer, what is a noun?"

The Personality of the Teacher.

By SARAH CORBETT.

It is true that no amount of mere knowledge will enable a teacher to put himself in touch with his pupils; but it will help him, when he *has* put himself in touch with them, to make a better use of the situation. Training for the teacher should throw some light on the main problem of how to acquire direct insight into mental processes, in order to influence them close at hand instead of from a distance. We all know that a "word spoken in season" produces more effect than many hours of teaching which does not chance—we call it chance—to touch the right note. Mental ailments, like bodily ailments, are produced by unwholesome food.

In the cases where teachers are honestly trying to find out the real needs of their pupils and to supply them, difficulties still remain, in the way of natural temperament, and these are not perhaps sufficiently considered in organizing classes in schools. Cases sometimes arise where children are permanently injured by being allowed to remain under teachers who, however well-meaning, are unable to supply their special intellectual needs—who praise when they should be silent, bring into prominence what they should ignore, discourage by blame of punishment some really healthy tendency—who, in short, are incapable of seeing what the child really requires.

Healthy development cannot go on without some amount of direct sympathetic insight on the part of the teacher. It is not only that the wrong words must not be spoken, but the teacher must learn how to make his influence felt by his mere presence. There is a force in character which underlies and is superior to all spoken words. And, indeed, words are only useful in so far as they correctly embody this subtle force. A teacher can never be successful who does not consciously or unconsciously, develop this force in himself, and learn how to use it. It would seem, therefore, that an important element in the training of teachers is the awakening and cultivation of the will power and the sympathies. These are often expressed more by the tones of the voice than by the actual words. The inner nature expresses itself more fully by the tones of the voice than in any other outward way. When the character changes, the tones of the voice change also.

Children do not, of course, analyze the effect produced on them by the personality of the teacher. Even in the case of adults, with well-trained minds, a judgment made by that region of the mind which borders

on the sub-conscious often presents itself to the fully conscious mind only in the form of a sense of harmony or discord. And this is still more the case with children or with uneducated persons. But the influence is felt though not analyzed, and produces its effect on the mind and character. The fully developed mind of an adult is, or ought to be, strong enough to gather to itself all the nourishment which its outward condition affords, and to refuse to be influenced by unfavorable conditions. But the mind of a child is not strong enough, or sufficiently experienced, to master and guide the mental influences to which it is exposed. Unfavorable mental influences may take permanent root in the character, and cause unhealthy conditions which cannot afterwards be removed.

The most common error made by a teacher in trying to control a class is that he endeavors to suppress natural tendencies, instead of guiding and directing them. The influence of a teacher over a class should be of the same nature that a man should use in governing himself. Human activities and emotions are natural forces, and can no more be destroyed than any of the physical forces. The will of man, however, can guide them in the right direction—can insist that they shall be creators, not destroyers. When a teacher arouses the interest of his class in some intellectual pursuit, by showing interest in it himself, and suggesting ways in which it is connected with the subjects in which the class is already interested, he directs so much energy, which would otherwise probably be expended in mischief, into a useful channel. Personal influence should always be expended in directing activity, not in endeavoring to suppress it.

Another mistake which young teachers often make is to try to get as much work out of the class as possible. This forces the pupils in self-defense, to try to do as little work as possible, and introduces that feeling of opposition between teacher and pupils which is one of the most objectionable elements in school life. If children were not at school forced into a position of antagonism there would be less self-seeking in later life.

The clue to the whole position is harmony of aim between teacher and pupils—the full realization on both sides of the fact that they are working for a common end; the substitution of the spirit of brotherhood for the spirit of competition. A teacher who has true sympathetic insight has the power of promptly grasping the manifold subtle mental influences which are at work at any given time and place, and of as promptly seeing the best way to deal with them. Wherever a number of human beings are together, there is always a certain amount of discord caused by the clashing of cross currents of inharmonious tendencies and desires. One who would lead his fellows successfully must learn how to weave these into harmony, to gain control of the nervous force that is flowing in wrong directions, and to direct it into the right channel. When the teacher is able to strike the right keynote, confidence on the part of the pupils in his willingness and ability to help them follows, and harmonious action is possible to a greater or less extent. Absolute harmony is never, of course, established, and is, perhaps, not desirable, for healthy natures can bear without injury a certain amount of discord, and will probably in the end give out richer music. But a constant succession of discords will put the healthiest nature out of tune. The intuitional perception, then, of the mental needs of others is one of the most important qualifications for a teacher. The born teacher is one who has this faculty naturally in a high state of development; but such natures are rare, and it is quite impossible to place all educational work in their hands. The faculty is latent in all, and may be developed by careful study, especially by the study of child-nature.

To develop it successfully it is necessary to look beneath the surface, to give one's attention to causes rather than effects, to find out the real meaning which lies beneath the outward form. It is especially necessary not to start with any hard and fast theory as to what children ought to be, but to study carefully what they are in fact.

The School Room.

FEB. 25.—NUMBERS, PEOPLE, AND THINGS.
MARCH 4.—PRIMARY NUMBER, ETHICS.
MARCH 11.—LANGUAGE AND DOING.
MARCH 18.—EARTH AND SELF.

Graded Lessons in Number.

By PROF. WM. M. PECK, Supt. of Schools, Whitestone, N. Y.

(Author of a New Primary and Advanced Arithmetic.)

"Ideas before words" is a truism which applies more closely to the teaching of Number than any other subject taught in our schools. Variety is quite as essential in teaching arithmetic as any other subject. Pupils must not be given complicated work—problems requiring too many conditions. The problems, from the very outset, should be presented in definite arithmetical language, perfectly simple, and within the easy comprehension of the child. The tendency in teaching number is to crowd the pupil outside of a limit within his comprehension, and give work far beyond the child's intellectual grasp. During the first, second, and third years at school concrete problems should be supplemented with *form work*, that the pupils may learn how to arrange the different operations in the fundamental principles. This "form work" should consist in part of abstract numbers, that the pupil's attention may not be too much divided, as would be the case if "thought problems" were used exclusively. In the grammar grades "form work" can be maintained through the use of concrete problems, in fact all work in these classes should be from the actualities of every-day life.

Let the slates or paper upon which the work is placed, be divided into squares or sections, inside of which the work must be arranged. In this initial number I shall give twenty lessons, covering as many weeks in the fifth year's work, or the second term of the first year in the grammar department, and continue them throughout the four years of grammar school work, with problems of the same character as are used in a well graded advanced arithmetic, not of the wearisome puzzle kind, but those that are in touch with the practical business methods of to-day. These problems can be cut out and pasted on cardboard, and used as extra work for the most active pupils, also written on the blackboards as general work, and various other ways which an active teacher may invent.

CARD I.

1. Harry had 3 score, 2.5 dozen marbles and lost three tenths of them. How many had he left?
2. How many tenths in $3\frac{1}{2}$, and $2\frac{1}{2}$?
3. How many half dimes in \$2.50. How many tenths?
4. If $\frac{1}{2}$ of a barrel of flour is worth \$4.80, what is 4.5 barrels worth?
5. A stationer buys paper at \$2 a ream, and sells it at 15 cents a quire. How much will he make on 7.5 reams?

CARD II.

1. How many cents in \$3.50? How many tenths?
2. At \$1.12 $\frac{1}{2}$ each what will 3.75 dozens slates cost?
3. A man bought a gross of assorted pocket knives at \$4. per dozen, and sold them at 40 cents each. How much did he make on the lot?
4. A miller having 80 barrels of flour, sold $\frac{1}{4}$ of it at \$4.75 a barrel. How much did he receive for the part sold?
5. A stock farmer paid \$1000 for a horse, \$325 less for sheep, and \$75 a piece for a herd of 13 cows. How much did they all cost him?

CARD III.

1. At \$.125 each, what will 2.75 packages of oatmeal cost?
2. A farmer sold 3 dozen ducks at 8 dimes a pair. How many dollars did he receive for them?
3. A grocer sold .75 of a barrel of flour to a customer at 4 $\frac{1}{2}$ cents a pound. What did he receive for it?
4. A grocer bought 125 pounds of Java coffee for \$41.25, and sold it at 40 cents a pound. How much was his gain?
5. A fruiterer had 3.5 dozens of cocoanuts in his shop, and purchased 6 $\frac{1}{2}$ dozens more. He sold $\frac{2}{3}$ of them for \$15.60. How much was that apiece.

CARD IV.

1. The loss on a harness sold for \$32.40 was \$8.75. What was the buying price?
2. A lady bought 3 pounds 12 ounces of tea \$.37 $\frac{1}{2}$ a pound. How much did it cost her?
3. If 1 $\frac{1}{2}$ pounds of coffee cost \$.45, how much could you buy for \$4.20?
4. A dealer bought apples at the rate of $\frac{1}{4}$ of a peck for 30 cents, and sold them at \$.56 a peck. How much was his gain on 2 bushels and one peck?
5. A provision merchant bought 23 barrels of pork for \$345, and sold it all at a gain of \$92. What did he get a barrel for it?

CARD V.

1. If .9 of a bin of coal costs \$63, what will the full bin cost?
2. If .5 of a gallon of syrup costs 30 cents, what will 7 $\frac{1}{2}$ gallons cost?
3. By selling a carriage for \$178, the owner lost \$27. What did it cost at first?
4. A merchant bought 42 yards of broadcloth for \$189. For how much must he sell it per yard to make \$31.50 on the piece?
5. A dealer paid \$526.50 for 3.5 tons of cheese, and sold it at 9 $\frac{1}{2}$ cents a pound. How much did he make on the whole quantity?

CARD VI.

1. My dining-room table is 12.75 feet long, and 3 $\frac{1}{2}$ feet wide. How many square feet in its surface?
2. If tea is selling for \$.62 $\frac{1}{2}$ per pound, what will 3.5 pounds cost?
3. If $\frac{3}{4}$ of a yard of broadcloth costs \$2.40, how many yards can be bought for \$19.20?
4. A young man receives a weekly salary of \$25; if he pays \$8.75 for board, and \$4.65 per week for all other expenses, how much does he save in a year?
5. I paid one-half dime for a box of blacking; 12 $\frac{1}{2}$ cents each, for one-half dozen cans of milk. \$.105 for a bag of flour. What was the amount of my bill?

CARD VII.

1. Multiply 3 tenths by 6 hundredths, and divide the product by 9 tenths.
2. Find the cost of 24.8 pounds of cheese at $\frac{1}{4}$ a pound.
3. What will 2.5 quarts of maple syrup cost at \$1.04 per gallon?
4. A grocer sold 23 barrels of potatoes for \$29.90, and lost $\frac{1}{4}$ on the cost of each barrel. What was the cost to him of each barrel?
5. A speculator bought 140 acres of land for \$7,560 and sold 86 acres at \$75 an acre, and the remainder at cost. How much did he make?

CARD VIII.

1. If a boy earns $\frac{3}{4}$ a day, how much will he earn in 40 days?
2. If .7 of a pound of butter costs 21 cents, what is the value of 5 pounds 12 ounces?
3. A merchant buys milk at 16 cents a gallon, and retails it at 7 cents a quart. What is his gain on a 10-gallon can?
4. A drover bought a car load of fat cattle containing 32 head for \$800, and sold them all for \$1120. What was his average gain on each?
5. A farmer exchanged 159 cords of wood at \$5 a cord, for a horse, valued at \$144, and the balance in sheep at \$3 apiece. How many sheep did he get?

CARD IX.

1. If 4.5 bushels of turnips cost \$1.80, what is the cost of 2 $\frac{1}{2}$ bushels?
2. How much will 6.5 gallons of milk cost at one-half dime per quart?
3. A lady bought 14.4 yards of carpet at \$1.25 a yard. How much was her bill?
4. If 4 ounces of tea cost 15 cents, how much can be bought for \$21.60?
5. A stock raiser bought 25 head of cattle for \$625. He sold $\frac{2}{3}$ of them at one time at \$35 each; 10 at \$30 apiece, and the remainder at \$25 each. What did he gain?

CARD X.

1. If one-half dozen of melons cost 90 cents, how many dimes will 3.5 dozens cost?
2. A merchant having \$135 bought 9 coats, and had \$18 left. How much did he pay apiece for the coats?
3. A builder bought a car-load of cement at 85 cents a barrel. How much did he buy, if his bill amounted to \$78.20?
4. A man owning 76 acres of land, sold 46 acres at \$37 $\frac{1}{2}$ per acre, and the balance for \$1275. How much did he get for all?
5. A miller bought 350 bushels of wheat at \$1.04 per bushel, and sold the flour and bran for \$539. What was his entire gain?

CARD XI.

1. In 6.5 dimes, 37 $\frac{1}{2}$ cents, and 15 mills, how much money?
2. A farmer sold a family 6 pounds 8 ounces of butter at \$.28 a pound. How much did he get for it?
3. A merchant sold 57 barrels of flour, which cost \$228, at an advance of $\frac{1}{4}$ per barrel. What was his price per barrel?
4. How many barrels of flour at \$4 a barrel, will pay for 48 hogs at \$15 each, and 54 lambs at \$5 a head?
5. If I pay \$2.70 for books, \$1.65 for a hat, \$13.50 for a suit of clothes, and \$4.70 for a pair of boots, how much shall I have left from a check of \$27.85?

CARD XII.

1. How much will 500 pounds of coal cost at \$.48 a ton?
2. Uncle Isaac gave his little nephew \$3.68 to divide equally among his 7 sisters and himself. How much did the boy keep?
3. Mr. Barney paid \$250 for a horse, $\frac{1}{4}$ as much for a wagon, and \$35 for a harness. How much did he pay for all?
4. A boy bought 5.75 bushels of chestnuts at \$.24 a bushel, and sold them at 5 cents a pint. How much did he gain?
5. A farmer sold 210 bushels of wheat at 96 cents a bushel, and bought hay at \$14.40 per ton. He afterward sold the hay at \$16.25 per ton; what was his gain?

CARD XIII.

1. How much hay at 75 cents a hundred-weight can be bought for \$3.
2. What will 2 pounds 8 ounces butter cost at \$.37 $\frac{1}{2}$ per pound?
3. A man bought a horse for \$150, and sold him so as to gain $\frac{1}{4}$ of his buying price. How much did he receive for him?

4. A man bought a farm for \$3,240, and sold it for $\frac{7}{8}$ of what he paid for it. How much was his loss?

5. A man bought two farms, one of 144 acres at \$24 an acre, and the other, 108 acres at \$30 an acre. He sold both farms at \$36 an acre. What was his gain per acre?

CARD XIV.

1. What is the cost of 6.5 tons of coal at \$5 $\frac{1}{2}$ a ton?

2. At 21 cents each, how many boxes of berries can be bought for \$26.25?

3. If 12 gallons of syrup costs \$6.48, what will 7.5 gallons cost?

4. A speculator bought 140 acres of land for \$7,560, and sold 86 acres of it at \$75 an acre, the remainder at cost. How much did he make?

5. How many pounds of tea at \$.25 a pound can be bought for 25 dozen eggs at 18c. a dozen, and 12 pounds of butter at \$.37 $\frac{1}{2}$ a pound?

CARD XV.

1. At 20 cents a peck, what will 5 $\frac{1}{2}$ bushels of apples cost?

2. At \$1.75 a rod, what will be the cost of one mile of fence?

3. What will 5 tons 500 pounds of hay cost at \$16 a ton?

4. I paid \$43.07 for 59 books, at what price must I sell 23 of them to gain \$5.08 on those sold?

5. Harry's father paid \$31.50 for 21 baskets of peaches, and sold each basket for 25 cents more than it cost. How much did he get for each basket?

CARD I.

1. 63.
2. 59 tenths.
3. 50; 250.
4. \$27.
5. 7.50.

CARD III.

1. \$3,437 $\frac{1}{2}$.
2. \$14.40.
3. \$6.61 $\frac{1}{2}$.
4. \$8.75.
5. \$.20.

CARD V.

1. \$70.
2. 4.65.
3. \$205.
4. \$5.25.
5. \$138.50.

CARD VII.

1. .02.
2. \$3.10.
3. \$65.
4. \$1.55.
5. \$1,806.

CARD IX.

1. \$1.10.
2. \$1.30.
3. \$18.
4. 36 lbs.
5. \$1.50.

CARD XI.

1. \$1.04.
2. \$1.82.
3. \$4.50.
4. 247 $\frac{1}{2}$.
5. \$5.30.

CARD XIII.

1. 4 cwt.
2. .9375.
3. \$210.
4. \$405 loss.
5. \$9 $\frac{3}{4}$ gain.

CARD XV.

1. \$4.60.
2. \$560.
3. \$84.
4. \$21.87.
5. \$1.75.

CARD II.

1. 350 cts.; 35 tenths.
2. \$5.62 $\frac{1}{2}$.
3. \$9.60.
4. \$285.
5. \$2,650.

CARD IV.

1. \$41.15.
2. \$1.40 $\frac{1}{2}$.
3. 14 lbs.
4. \$1.44.
5. \$19.

CARD VI.

1. 44.625.
2. 2.18 $\frac{3}{4}$.
3. 6 yd.
4. \$603.20.
5. 1.85.

CARD VIII.

1. \$15.00.
2. \$1.72 $\frac{1}{2}$.
3. 1.20.
4. \$10 gain.
5. 217.

CARD X.

1. 63 dimes.
2. \$13.
3. 92 bbls.
4. \$30.
5. \$175.

CARD XII.

1. \$1.20.
2. \$.46.
3. \$4.35.
4. \$4.60.
5. \$25.90 gain.

CARD XIV.

1. \$35.75.
2. 125 boxes.
3. \$4.05.
4. \$1,806.
5. 36 lbs.

he may arrange equivalents to the second given fraction, and so on.

The set given may be miscellaneous, as those in the first

Table of Equivalent Fractions.

$\frac{1}{2}$	$\frac{2}{4}$	$\frac{3}{6}$	$\frac{4}{8}$	$\frac{5}{10}$	$\frac{6}{12}$	$\frac{7}{14}$	$\frac{8}{16}$	$\frac{9}{18}$	$\frac{10}{20}$
$\frac{1}{3}$	$\frac{2}{6}$	$\frac{3}{9}$	$\frac{4}{12}$	$\frac{5}{15}$	$\frac{6}{18}$	$\frac{7}{21}$	$\frac{8}{24}$	$\frac{9}{27}$	$\frac{10}{30}$
$\frac{2}{3}$	$\frac{4}{6}$	$\frac{6}{9}$	$\frac{8}{12}$	$\frac{10}{15}$	$\frac{12}{18}$	$\frac{14}{21}$	$\frac{16}{24}$	$\frac{18}{27}$	$\frac{20}{30}$
$\frac{1}{4}$	$\frac{2}{8}$	$\frac{3}{12}$	$\frac{4}{16}$	$\frac{5}{20}$	$\frac{6}{24}$	$\frac{7}{28}$	$\frac{8}{32}$	$\frac{9}{36}$	$\frac{10}{40}$
$\frac{1}{5}$	$\frac{2}{10}$	$\frac{3}{15}$	$\frac{4}{20}$	$\frac{5}{25}$	$\frac{6}{30}$	$\frac{7}{35}$	$\frac{8}{40}$	$\frac{9}{45}$	$\frac{10}{50}$
$\frac{1}{6}$	$\frac{2}{12}$	$\frac{3}{18}$	$\frac{4}{24}$	$\frac{5}{30}$	$\frac{6}{36}$	$\frac{7}{42}$	$\frac{8}{48}$	$\frac{9}{54}$	$\frac{10}{60}$

column of our suggestive table, or they may follow one denominator up to unity, as $\frac{1}{2}$, $\frac{2}{4}$, $\frac{3}{6}$, $\frac{4}{8}$. This work may be adapted to almost any grade.

Use of News Cuttings. I.

By E. E. K.

One of the principles most emphasized by "new educationists," is that we learn the remote through the near. Applying this to history, it is through the prominent events of the day that the pupil may find the best introduction to those of the past. Our department, "Important Events" is a very carefully sifted chronicle of what is going on about us and making the world's progress. Each of these little paragraphs is pregnant with suggestion to the teacher who would give her class a living grasp upon the subjects he is studying, especially upon the great subject of history. For the present purpose, we select from OUR TIMES, a paper rich in similar material, the following:

THE PANAMA INVESTIGATION.

The world has never seen a greater scheme followed by a more dismal failure than the attempt to build a canal across the isthmus of Panama. A man who has recently returned from the isthmus says:

"Over 1,500,000 francs (\$300,000,000) have been taken out of France, carried down there to Panama and dumped into the mud. Thousands upon thousands of lives have been sacrificed and the work has drained the black population of the Antilles as no war or pestilence could have done. Unknown multitudes of Asiatics were poured into the country, almost one-quarter of whom committed suicide, while the others died like rats. That isthmus is a grave from Aspinwall to the Pacific of millions of money, multitudes of human beings, and of the ambition of a nation."

The \$300,000,000 squandered represents the savings of the French peasantry. The greater part of the money was obtained by peddling millions of shares at a few francs apiece among the people, where the purchase of a single share reached the extent of a whole family's savings.

And what are the present conditions? At Panama there are two great cities almost deserted, an excavation that has been filled up again with the earth that was thrown out of it, dredges covered over with vines, and palm trees that have grown again where the canal had been dug, miles of railroad tracks on which stand hundreds of locomotives that never turned a wheel, thousand of steel dump cars, and the switches on the sides of Culebra mountain that are being washed off into the Chagres river by the cloudbursts that mark the rainy season of the tropics.

WHO IS RESPONSIBLE?—The head of the Panama company was Ferdinand de Lesseps who carried the Suez canal project to successful completion. The laurels he obtained from that great enterprise were such that the French people had unbounded confidence that he would succeed in completing the canal at Panama, and that the holders of shares would reap large profits. But there was mismanagement, extravagance, and much downright dishonesty. The government itself became implicated in the swindle by encouraging the raising of more money when the officials knew that the company was bankrupt. To add to the disgrace the whole French press was hired to conceal the facts from the people.

THE TRUTH OUT AT LAST.—When the truth became known, of course the indignation was great, and it has already caused the resignation of one cabinet. The government, however, is carrying on the investigation with seeming earnestness, and several of the Panama directors are in jail. Fears have been expressed that the scandal might endanger the republic. The royalists have been attempting to get up a demonstration to overthrow the present form of government, but, in spite of the volatile nature of the French people, it is believed that it will not succeed.

What a fund there is here of thought to take hold of the pupils and bring them close to their studies! How can they help feeling the gravity of the subject? How can any one who knows our boys and girls question that the day's work would be well done were it made to radiate from and return to this question of real and present, yet gigantic, intrigue and wrong? And who doubts that such a day's work could be made up? Let us see:

Geography.—Where is the isthmus of Panama? (Latitude? Longitude?) What continents does it connect? What waters does it separate? What is an isthmus? Suggest a reason why it *might* be difficult to build a canal across this particular isthmus? What is a canal? Why more difficulty here than at the isthmus of Suez? Where is the isthmus of Suez? (Longitude? Latitude?) What does it connect? What separate? In what

Silent Work in Arithmetic.

A suggestion was made in our columns some time ago which is here somewhat elaborated.

Give the pupil a set of fractions, which he may write in a column, enclosing each in a square. From each he may draw a line of squares to the right and proceed to fill them with fractions equivalent to that in the first square. Beneath, in the next row,

[Five cards and their answers are omitted from the above set. They will be given in a future number.]

directions do ships move in passing through it? Where are most of them bound? What cargoes? Where from? How did they go before the canal was made? How much distance is saved? How much time by average steam vessel? Average sailing vessel? Why was it desirable to have a similar canal across Panama? What trade served, etc.? Why is the climate so unhealthy at Panama? What "two great cities" are they that are described as "deserted"? What do you know of the truth of this? What reason can you assign for their desertion?

Home Work.—Consult references on such of the above questions as has not been possible to answer or clearly discuss in class. Prepare results in writing for comparison next day.

History.—How long has France been a republic? What was her last form of government? How far must we go back in the history of France to find a time when the same form of government continued from century to century? What were the evils of this old form? To what great outbreak did they lead? Write a composition contrasting the life of Marie Antoinette before she realized the true situation of affairs and her condition afterward. What great military star arose out of the tumult into which France was thrown at this time? If you know more about Napoleon than you do of Marie Antoinette, let your composition tell what you think of his deeds and character. What were the successive changes in the French government from the revolution down to the present time? Who is president of France now?

Home Work.—Researches and compositions.

Civics.—What is a republic? What leading nations are now republics? What are the chief differences between the constitution of the French republic and our own? Do you think you see any advantage in either? Pope says: "Whate'er is best administered is best." Why is not the republic of France well administered? Would the people of France do well to go back to the old monarchical government? Which is worse, to be ruled by a privileged aristocracy or by an unprincipled set of officials? In what does the real remedy for the situation lie? What is the regular term of service for each of the leading officials in the French government? What is the term for each corresponding official in the United States? How do you account for the fact that our affairs are more honestly administered than those of France? (Is it not that a more mixed popular sentiment exists in France, embracing with the new ideas of freedom and equality, a lingering respect for old and titled families, and a contempt for the peasantry, while with us a more universal republican spirit exists, with insistence upon equal rights for all and privileges for none?) There are people who honestly believe that there should be no such thing as government—that without governmental protection from fraud, people would in time learn to take care of their own interests. What do you think about this theory? How long do you think it would take the thrifty French peasants to learn to distinguish between honest and dishonest corporations? Have they a right to protection against dishonest ones? Are they themselves a protection to any great interest?

Home Work.—Researches and statement of facts and conclusions.

Reading.—Afforded by work of looking up facts, etc.

Spelling.—In composition, etc. Add special study of a set of words selected from the extract.

Penmanship.—Neatness and legibility demanded in compositions. Add a special exercise upon one of the titles used for composition, or some proper name, or upon *The American Republic*.

Ethics.—What is meant by "the volatile nature of the French people"? To what awful extremes can you point in the national conduct of the French? Do you believe that the Frenchmen realize the danger that accompanies their national fault? What is most likely to teach them its gravity and induce them to cure it if possible? (A study of their own history.) If we have a national fault, how shall we learn what it is and what its effects are? Can you suggest a fault that is ours as a nation? (Personal lukewarmness toward our duty as citizens to keep the administration pure by electing honest men.) How about the rogues who robbed the hard-working French peasantry and enticed so many laborers to death upon the isthmus—do you think they are happy? Suppose them to escape legal justice—do you think they could be happy? Are you happy after you have done wrong? If a fault makes you suffer remorse, do you think a crime could cause happiness? There is a theory that people are not always punished for wrong-doing; what do you think of this theory?

Home Work.—Composition on *Unseen Punishment or Our National Danger*.

Arithmetic.—How much is a franc worth in U. S. currency? Is the reduction given, 1,500,000,000 fr. = \$300,000,000, correct? How many young men or young women would this sum support through a four years' course at college at \$600 a year each? How many children would it enable poor parents to take out of factories and send to school four years by paying the children's wages, at the rate of \$2 per week per child? How much medical attendance for the sick would it pay for at \$2.00 per visit? How many pensions would it pay to broken-down workers at \$400 a year for each? How many blankets, at \$5.00 per pair would it purchase? (This may be oral arithmetic for the more advanced or slate

arithmetic for the younger pupils. Good subjects for research are the expenses of this Suez canal, for comparison with the figures given in the connection; the bankruptcy laws of France and the United States; the average wages of French peasants, etc., etc., etc.)

Home Work.—Solve the above examples on paper and arrange your answers in statistical form. (By simplification of language, this work may be made suitable for the higher primary grades.)

Men Who Excite Interest.

One of the things that can be learned to advantage at the exchange editor's desk in a newspaper office is, that there is always a limited number of men in the world concerning whom their fellows cannot learn too much. Stories of such men are continually straggling into print, and the discriminating exchange editor, recognizing their current value, is constantly snipping them out and serving them up to his readers. In many cases some passing incident or exploit recommends an individual to the exchange editor's attention, but that sort of notoriety is short-lived. Thus Perry, the train-robber, was the exchange editor's best man for several weeks, and Sullivan, the bruiser, furnished him in his time with many columns of anecdote, but they and their like are mere comets that cross the orbit of the shears and flash away.

But there are other men who are useful to him year after year—as long as they live and even for years after—men, such as Washington and Franklin, whom people are never tired of reading about as long as there are fresh tales forthcoming.—*Harper's*.

QUESTIONS.

Who is the exchange editor?

Why does he notice such men as Perry and Sullivan?

Why are such names as Longfellow, Washington, and Franklin of more permanent interest?

If all people were well educated would there still be a demand for news of train robberies, etc.? Why?

Would there still be a demand for news of prize fights, etc.?

Minerals. VII.

GYPSUM.

By MINER H. PADDOCK, Jersey City, N. J.

Physical Properties.—This mineral possesses qualities that next to calcite render it an interesting study in any collection for educational purposes.

It comes in snowy and glistening masses, sometimes pink, sometimes pearly, translucent or brown, like the alabaster spar from England. It occurs in various countries, in beds among other rocks. It is characterized as a soft stone and readily takes a polish. It is probably formed by the action of sulphuric acid, derived from some sulphide, as pyrite, against limestone,—the latter being calcium carbonate, while gypsum is calcium sulphate.

Each pupil has in hand a piece of gypsum if possible differing from some of the others in the non-essential points of the mineral. The pupil has also a streak-table (piece of unglazed white porcelain) and a small sharp-cornered bar of steel for scratching minerals. The teacher has at the desk a test-tube to be used as a closed tube, a lamp (kerosene lamp with chimney will serve), and a bottle of hydrochloric acid.

It would be well if small bottles of this acid with glass dropping rod could be placed on each desk. The teacher may also have a blowpipe and forceps or charcoal for holding bits to be tested. The teacher's outfit depends on how much of chemical work he or she may judge best to bring before the pupils, regarding their age.

The pupil may have taken his mineral home, and having studied it by a scheme of tests may be prepared to recite and criticise. This with pupils is a very popular method. Or the mineral with mineral-box containing his limited supply of apparatus may be handed to him at the hour, when the exercise becomes one of original investigation in the class-room. The latter method may be more generally employed in young grades. Let us look in at this room as the lesson proceeds.—

Scholars, you observe upon the board the list of tests which we have made out for our minerals. (Art. No. III.) You have had a few moments for studying the mineral which you have, and which you have learned to call gypsum. Some of you have written your answers on paper: What is our first test? "Hardness." Tell me about the hardness of gypsum. "I find it is harder than the last one we had. I can just scratch my piece with my thumb nail." "I can scratch mine quite easily." Yes, we have fairly settled its hardness in a former lesson. It ranges from 1.5 to 2.

George may tell me what is meant by *cleavage*. "When a mineral parts with a smooth face any number of times in the same direction it is called cleavage." Has this cleavage? "It seems to have broken in all directions." "It has not broken twice in the same direction." "It has no parallel faces." A hand is raised. "Mine has parallel faces." Yes, this transparent piece, called selernite, has cleavage. It is in layers, as we may say.

What do we mean by *fracture*? "When it parts in any direction." "No two directions the same." "When it breaks cross-wise." What can we say of the fracture of gypsum? "It is uneven."

We have next tenacity. Tell me what is meant by the word? "The way anything holds together when you try to pull or break it apart."

When it requires considerable force to break the mineral apart, what do we call it? "Tough." "I do not think this can be very tough." "I have chipped off a piece quite easily." "Brittle." Yes, you might call it brittle, but there is a shade of meaning we may distinguish in minerals.

Compare it first with this bit of calcite and of galena. See how they fly in pieces when I strike them. I try to cut them; still they break in pieces and will not cut.

Now one of you, Charles, may come forward. Take this knife, see if you can cut the gypsum. It cuts. Lay this small bit on the iron block; see if you can powder it with the hammer. What happens? "It breaks into pieces." Yes, now you have it. It will not flatten out as if it were— "Malleable." It breaks like brittle, and yet it cuts; we might call this *cut-able* but the term *sectile* is used.

We have used four terms to characterize minerals in regard to their tenacity. Two other terms are useful in this connection which you have learned in other studies.

When a substance bends, what do we call it? "Flexible." And when it springs back, what is it? "Elastic." Have we had a mineral that is somewhat flexible? "Steatite." I hold up this piece of mica, bend it, and let go. Tell me what you can say of it? "It is flexible and elastic." Is our gypsum either? "No, sir."

I see a hand raised,—what is it you wish? "Why should we not say hard as well as tough and brittle?"

Hardness for convenience as a test with minerals is put by itself. When the cohesive force holds the molecules strongly together so they cannot be pulled easily apart, the body, or substance, is tough. When it holds them rigidly so they cannot be moved upon one another it is hard.

A body may be tough and soft, as copper; it may be hard and lack in tenacity as diamond, which, the hardest mineral, is quite brittle. These steel scratchers are exceedingly hard, but a quite light rap will break them like pipe-stems.

This pyrite is hard and quite tough; and this corundum, especially, is both hard and tough. A body may be both soft and brittle, as chalk; we call it friable.

We will make a group of what we have learned of tenacity for future use.

1. Tough, like corundum.
2. Brittle, like calcite, galena.
3. Sectile, like gypsum.
4. Malleable (like copper, lead).
5. Flexible, like steatite.
6. Elastic, like mica.

Remembering *sectile* will help us to distinguish gypsum from some other similar appearing mineral.

Other Physical Properties.—What about its color? "White." "Brown." "Pink." "Clear." "Without color." We have all these. Now take your little streak-tables, and draw your mineral slowly across it. What happens? "It makes a streak." The rough surface of the unglazed porcelain takes hold of your gypsum, cuts off a thin layer, and leaves a line of powdered gypsum on the porcelain. What is the color? "White." Does the brown leave a white streak? "Yes." "My very brown piece leaves a brown mark." Draw your sharp cornered scratcher across it, what does it leave? "A white scratch."

That is singular, is it not? It shows the importance of noting the powder of a mineral which has not always the same color or appearance as the surface. Why is this? you ask. The surface we say is brown or pink because it absorbs from the light all but these and reflects the pink or brown rays. But in the powdered form it absorbs and reflects all equally, appearing therefore white.

Now hold your mineral up to the light, turn it about, and tell me what more you observe about the light that comes from the surface. "It seems to shine a little." "Mine glistens." "Mine does not shine, it is dark." "I think this selenite has a kind of pearly look." We will remember all these descriptions you have given me.

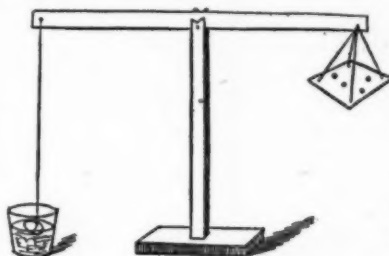
Does it shine like this pyrite? "It does not." Does it shine like any metal? "No, sir." Then its luster is not metallic. Does it shine like this piece of quartz? "Mine does a little." "Mine does not." You have seen broken glass? "Yes, sir." Is this luster any like that? "It is some like it." Does the quartz look any like broken glass? "It does." "Well, then, this luster we will call vitreous, because it is like broken glass, and the luster of gypsum, which is somewhat like the glass, we will call sub-vitreous. We put on the board our description of the luster of gypsum and will complete our scheme of the kinds and degrees of luster at some future time:

Luster of gypsum,—subvitreous, shining, pearly, glistening, dull.

"My piece is opaque." "Mine (selenite) is transparent," "The

touch is rough." "These pieces are massive." That is to say, they are not in form of crystals. "Is this transparent selenite a crystal?" No, it is crystallized, but not a crystal, for it has no definite exterior form. The selenite is foliated, or in leaf-like form.

"It has no magnetic, no electric properties." It seems rather light for a mineral."



Specific Gravity.—Whom did we appoint, to demonstrate the specific gravity? You are ready, I see. William will use the apparatus, Julia will read the results, and Jessie will place the results on the board where we can all see. What have you to say?

George: "I tie this piece of gypsum to this short string and fasten it on one arm of the scale. I put a similar string in the opposite scale pan, to balance the first string, and I put in weights till the gypsum is balanced."

Julia: "The weights show that the gypsum weighs in the air 512 grains."

Jessie: "I write on the board, weight in air 512 grains."

George: "I introduce a glass of water under the mineral, and the mineral is lifted as the water touches it. It has lost weight. To make the beam level again I take off weights from the scale pan to again balance."

Julia: "The piece weighs in the water 289 grains."

Jessie: "I write on the board, weight in the water 289 grains. I subtract and write, loss of weight in the water 223 grains."

What does the loss of weight represent? "The weight of a volume of water equal to the volume of the mineral."

What may we do with it? "We may compare it with the weight of the gypsum to find how much heavier gypsum is than water."

What is the process? "By division. Water is the standard; we make it the divisor, and find that gypsum is 2.3 times as heavy as water. Hence we say its specific gravity is 2.3."

Notes.—Streak tables and steel scratchers, magnetized to serve as magnets can be had at trifling expense.

A home-made acid bottle with glass rod stopper can be furnished at small expense, as described in a former article. The writer uses a box with compartments to hold the minerals of the primer collection, and the apparatus mentioned in this article.

Abstract of a Lecture on Astronomy.

By PROF. ROBERT SPICE, at the Girls' High School, Brooklyn.

When we entered the room Prof. Spice was describing the condition of an astronomic nebulous mass with relation to gravity. It would be impossible to imagine such a mass in a state of perfect balance, he said, and any motion toward the center would have a rotary tendency, as is seen in water escaping through the middle of a basin. The direction of the rotation would be entirely a matter of accident.

The nebulous mass, having no immediate attraction outside, would have a strong one toward its own centre of gravity. This centripetal action, with the least obstruction or interference, would result in a rotary motion, which might take a left-handed turn or a right-handed turn, according to the direction of the interfering force.

Matter revolving on an axis of its own, as this mass would necessarily do, in time, has a tendency to form rings. These rings continue the rotation, until they break and roll over on themselves in one mass or more, take the globular form, as matter must when floating freely in a gaseous or fluid state, and go circling round the central mass in an orbit formerly occupied by the ring.

This part of the lecture was beautifully illustrated by means of the stereopticon. A mixture of 9 parts alcohol and 7 parts water offered a medium of the same specific gravity with olive oil. In the center of this liquid mass a disk was fixed, by means of a rod, and a thread attached in such a manner that by pulling one end or the other, the rod and disk could be rotated in either direction. Little by little, olive oil was applied to each side of this disk, until it formed a liquid globe in a liquid medium of its own specific gravity.

Then the disk was rotated, gently at first. The spherical body seemed to try to rid itself of some of its mass by centrifugal action. The tendency to form a ring was very apparent. When this tendency had been observed, the rotary motion was quickened and the ring actually separated itself, revolved as a ring for a second or two and then broke in two places, immediately gravitating into two beautiful spheres which circled round the disk in the

direction originally imparted to the parent mass.

To thus witness the birth of two twin planets being calculated to rouse a too confident sense of "Now I see how it's done!" Prof. Spice proceeded to administer an antidote to the hastiness of scientific enthusiasm in the remaining portion of his lecture.

The experiment, he said, was in one respect, opposed to the nebular theory, the ring being thrown off by centrifugal action, while the process in the solar system has been rather one of shrinkage within and abandonment of the ring by the central mass. The planetary ring is formed where it happens to be, and as long as it remains unbroken, indicates the circumference of the solar sphere as it occupied space previous to the formation of the ring. The last ring abandoned by the sun became, when it broke, the planet Mercury.

The solar system, he went on to say, is an island in space. Its great distance from any other system or star is known to be immeasurable even with the radius of the earth's orbit (93,000,000 miles) as the unit of measurement. It would take more than 200,000 such units to measure the distance to the nearest fixed star. The unit used by astronomers is the distance light would travel in a year, called the "light year." How long does it take light to reach us from the sun? 8 minutes (about). How many times 8 minutes are there in a year? When you have ascertained that you will have a rough estimate of the number of miles in a "light year." With this as a unit to measure by we can fathom the depths of space. The distance to our nearest stellar neighbor, Alpha Centauri, is said to be 3.262 light years, so that if anything should happen to this neighbor of ours, it could not be reported in our papers for more than three years, even though light travels with such inconceivable velocity.

But in the case of the Pole Star this calculation may be twenty-five per cent, out of the way. If we make a mistake of $\frac{1}{16}$ of a second of arc on taking the parallax of a star (and that is about as near as we can get) we state our distance a quarter more or a quarter less than it really is. There is no reason why we shouldn't go on trying, only don't run away with the romantic idea that these vast distances are known to the mile.

The light from remote stars probably takes thousands of years to reach us. This is one of the facts that tax to the utmost our acceptance of the wave theory of light. When a stone is thrown into the water, the ripple that circles from it becomes less and less and finally dies out. It becomes less by extension, though it expands in a circle only. The waves of light that leave a star expand in spheres and how they can reach us with sufficient force to affect the retina of the eye is one of the marvels to which the scientific mind has to accustom itself.

Experimental Physics.

By RUTH E. LANDER.

LESSON I.

In experimenting there must be certain facts of which we are tolerably certain at the outset.

These facts lead us to place things in certain situations, in order to find out what results will follow.

Then, in the light of these results we reason from the things previously known to things unknown, *i. e.*, to facts which we wish to ascertain.

Have the pupils perform the experiments for themselves, and arrive at their own conclusions. Much of the apparatus may be made or brought in by the pupils. Drawings should be made by the pupils, showing result of their observations.

AIM OF LESSON.

To show that air occupies space:

Exp. I.—Fill a small measure with apples or potatoes. Add more. They fall off. Why? Draw from pupils the fact that the substances used *occupy space*.

Exp. II.—Procure a bottle; fill with water; overflow it; why did the water overflow?



Exp. III.—Have pupils originate other experiments, showing same principle.

Exp. IV.—Proceed in like manner with various objects until pupils see clearly that *all objects occupy space*.

Exp. V.—Have pupils try putting both hands into one of their mittens or gloves; two keys into one lock, two corks into one bottle, etc.

What happens in each instance?

Inference.—No two substances can occupy the same space at the same time.

Give a short talk on air.

Exp. VI.—Have pupils stand, and with closed mouths inhale.

Obs.—Appearance of chest.

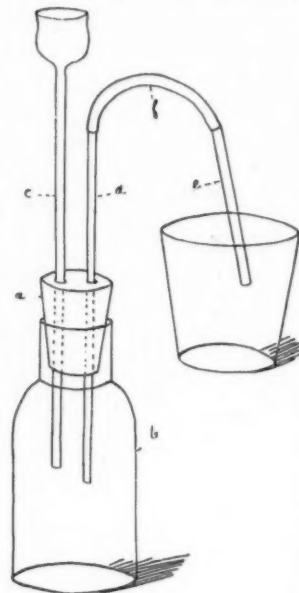
Ques.—What causes the chest to rise?

Exp. VII.—(a) Procure a small glass or tin tunnel, and a bottle having mouth slightly larger than tunnel. Fit the tunnel

into mouth of bottle, by wrapping the tunnel closely with tissue paper. Pour water into tunnel. Result.

Exp. VII.—(b) Remove paper, making exit for air. Repeat. (a) Compare results. Questions: What occupies space in Exp. VII. (a)? What in (b)?

Exp. VIII.—Fit a rubber stopper containing two holes (a) into 8-oz. bottle; (b) through one hole pass a thistle-shaped glass tube; (c) through other two sections of glass-tubing one 6 in. and the other 3 in., (marked d, e), and united by rubber tubing 4 in. long (marked f).



Fill a plain glass tumbler or beaker with water. Insert glass tube. (e) Into thistle-shaped tube pour water. Result: Bubbles seen in tumbler. Why?

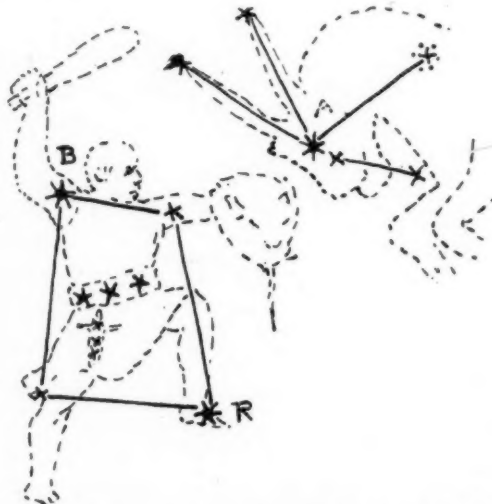
Exp. IX.—With same apparatus as in *Exp. VIII.* Pinch rubber tubing, entirely closing opening. Pour water into thistle-shaped tube. Result: Water remains in tubing. No bubbles. Why?

Universal Law.—Air occupies space.

Books recommended and used in preparing this lesson: Appleton's "School Physics"; Shaw's "Physics by Experiment"; Gage's "Introduction to Physical Science"; Ganot's "Popular Natural Philosophy."

Among the Stars.

There is appearing in the eastern skies about ten o'clock every night one of the most remarkable of all the constellations; it is Orion. In January and February the splendor of this group of stars will attract attention as it did in the early years of the world. Orion is imagined to be a hunter who has returned from the chase with the head of a lion in one hand and a club in the other. Around his body is a belt represented by three bright stars. It is to this that Job alludes when he says, "Canst thou loose the bands (or belt) of Orion?"



The constellation consists in the main of a quadrilateral; at the opposite corners are two first magnitude stars, Betelgeuse and Rigel; within is the belt of three stars of second magnitude, and just below the belt is the knife or short sword the hunter is supposed to have worn.

Just above Orion, a little to the west, are the Pleiades, sometimes called the "Little Dipper."

Now between the Pleiades and Orion is another group called the Hyades, and among them one of the first magnitude, Aldebaran. The Pleiades and the Hyades, with Aldebaran and a few stars of the third magnitude, form the constellation "Taurus the Bull."

Supplementary.

Tambourine Drill.

(For the Primary Department.)

By ELOISE HEMPHILL, Tuscaloosa, Ala.

(A Spanish costume is very pretty for this drill, but a dress of any color and material may be used. Ribbons, corresponding to predominating colors in costume, should be tied through the thumb-hole of tambourine. Arrange the class with the smallest in front; in marching to places, have the class march single file down the center of stage; numbers 1, 3, and 5 turn off to the left and stop about three feet apart on the front line; numbers 2, 4, and 6 turn to the right and take their stand three feet apart on front line; numbers 7, 9, and 11 take their places three feet behind 1, 3, and 5 respectively; numbers 8, 10, and 12 behind 2, 4, and 6, and so on until all the odd numbers stand on the left half of stage, and the even numbers on the right half. Pupils should hold the tambourines in the right hand, at the side when marching, and throughout the entire exercise. The arms and body should move gracefully. The eyes should follow the tambourines in every movement except in positions 8 and 10.)

1st. Position.—With drum of tambourine turned toward the audience, strike the front of tambourine with tips of fingers of left hand on the odd beats through 8 counts.

2nd. Position.—Throw right arm obliquely across front of body to left side, and strike the tambourine against left finger tips, through 8 counts as in first movement.

3rd. Position.—Swing tambourine from left to right alternately, striking once each time through 8 counts.

4th. Position.—Holding tambourine up to the right, proceed as in direction one.

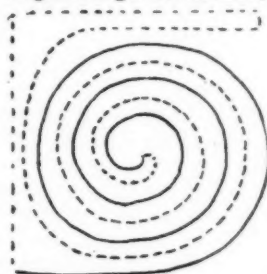
5th. Position.—Holding tambourine up to the left, proceed as in direction 2nd.

6th. Position.—With arms still up, alternate from left to right as in direction 3rd.

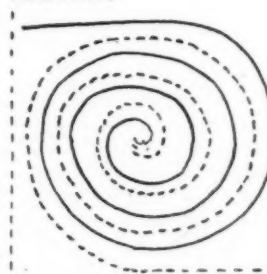
7th. Position.—Strike once at right side with arms down as in position 1; once at left side with arms up as in position 5; once at right side with arms up as in position 4; once at left side with arms down as in position 2, repeat through 16 counts.

8th. Position.—Left hand on hip; body slightly bent forward as if listening, standing with weight on right foot which is about 12 inches in advance of left foot; bend right arm at elbow until side of tambourine rests on right shoulder; shake tambourine gently through 8 counts.

9th. Position.—Feet in same position; body straightened with weight thrown on left leg which is slightly bent; right one perfectly straight; eyes forward; left elbow at waist line hold the fore-arm in front of body, in an easy, graceful position; bring tambourine down from right shoulder on the odd counts, striking it against fingers of left hand; through 8 counts.



CENTER



MARCH.

At a given signal, all rise from kneeling position with tambourine held at right side. Half of the class turn to the left and half to the right following their respective leaders, who march to the left and right making each a circle, as shown in diagram below. When leaders have reached the centers, at a given signal, let every one raise arms above head and strike tambourine in perfect time with music; while leaders wind their way out, which is done by following the dotted lines.

"Through THE JOURNAL pages I have learned more of true teaching than from any source."

Monongahela City, Pa.

MISS MARY E. HAMMOND.

My Dolly.

(The little girl who recites these verses should display a large doll.)

My Dolly went to ride in a sleigh,
And I was the horse to draw her;
She tumbled out—I was running away—
And O there was nobody saw her;
But I found her at last in a bank of snow,
All so smiling and rosy,
Just as patient and good, you know,
As if it were warm and cozy.

I took her in and put her to bed—
I was sure she must be freezing;
I rubbed her feet and I rubbed her head
For fear it would set her sneezing.
Now she will soon be well, no doubt,
But I've made a resolution
To take more care when she goes out
Of my Dolly's constitution.

—St. Nicholas.

A Mystery.

(A recitation for a very small boy.)

I put my coat and hood and furs and mittens on to go
With my cunning Christmas sled out to see the pretty snow.
I made some little balls, and they looked so white and nice,
I tried how one would taste, but it was just as cold as ice;
I took some to the kitchen then, because I thought, you see,
I'd bake them just like apples—they'd be good with cream at tea,
I didn't say a single word about it to the cook,
When I put them in the oven, but when she gave a look
She stared and held her hands up, and said: For pity's sake!—
Who put this water in here and spoiled my ginger cake?
I couldn't tell. It wasn't I. But I would like to know—
Where did my pretty apples that I was baking go?

—Sydney Dayre, in *Castle's School Entertainments*.

The Woods in March.

The woods are still sleeping,
But grass is a-peeping
Out from under the snow;
The swallows are coming,
The bees are a-humming,
The sap has begun to flow.

The buds that were hidden
In brown coats are bidden
To break and let the world know;
The Ice King is quaking;
And Springtime is breaking,
For sap has begun to flow.

—The Kindergarten.

De-po, Da-po, Dep-po, Dip-po.

Said Master Jones, "Now must we go,
Without delay, to the *dee-pot*."
Laughed sweet Miss Jones, "I should say so,
Let's start at once to the *day-pot*."
Smiled Mrs. Jones, "In quick-*step*, oh,
We'll all run down to the *dep-pot*."
Groaned Mr. Jones, "It's mighty *hot*,
To drive you all to the *dee-pot*."
"But John, the coachman, who's La Grippe, O,
Says *he* can't drive you to the *dip-po*?"
These conflicts of pronunciation
Would not be, if they called it "station."

—Selected.

My Little Neighbor.

(Recitation for first year in primary.)

By AGNES M. MANNING, San Francisco, Cal.

A bird sits singing in our tree;
This is the song she sings to me,
"O, don't you touch my little nest!
But leave my birdies there at rest."

Every morn when I awake,
Some crumbs of bread to her I take;
Every night she waits to see,
That I'm in bed and sings to me.

Editorial Notes.

Who will be the next commissioner of education? It is probable that the change in the administration of our national affairs may involve the retirement of Dr. Harris, who has held the office for the past four years. There are several candidates in the field. The Southern teachers are making an organized effort to secure the appointment of Supt. Warren Easton, of New Orleans, whose portrait and biography appeared in *THE JOURNAL* of January 7. If there is to be a change, Supt. Easton will undoubtedly prove a strong candidate. He is recognized as an educational leader of the highest type and is in every respect qualified for the position.

Some unwarrantably harsh exaggerations were used by the Christian Endeavor Society last summer inveighing against the "un-American and un-Christian" proposal to have the World's fair kept open on Sunday. This was a bad method, and it may be held in part responsible for the fact that the sentiment of the country seems now to be "overwhelmingly in favor of an open fair."

Yale's new gymnasium, completed at a cost of about a quarter of a million of dollars and occupying nearly half a block of ground, is at last ready for use. The influence of aesthetics upon gymnastics should here, if anywhere, be felt, for we are told the building, inside and out, is constructed and finished in exquisite taste. If lavishness on the part of our wealthier colleges toward physical education can arouse enthusiasm for it among the lower schools, much good will be done.

Louise Worthington, in *Harper's Weekly* for Jan. 28, takes an original view of the reappearance of crinoline, regarding it as one of the machinations of woman's arch-enemy, Man. She treats the subject in an article rich with humor and deep with seriousness. It is a good high school article. History sees these waves of folly rise to a lesser height every time they come. What does this mean? There was a time when the trained skirt found universal favor for walking dresses, but the recent attempt to reintroduce it met with a comparatively feeble reception. Has the higher education of women anything to do with this, or is it a result of a general advance in "common sense"? These are questions that concern teacher and class.

Teachers can procure copies of the various pension bills before state legislatures in this country by writing to the assemblymen of their respective states. This question of pensions is a grave one, and teachers should not decide it on wholly interested grounds. Study the arguments of those who would reduce the pension list. Study Spencer's powerful article against state socialism "From Freedom into Bondage." Take not a personal, but a world-wide view of the question and apply the test of the "deadly parallel column." Put the advantages to education, consequently to the people, that would come of pensioning teachers, side by side with such dangers as you are willing to concede may attend the ultimate effects of a continued enlargement of the pension list, and strike a balance. Then study the subject all over again—not to find more arguments on one side, but to find more arguments on both sides.

Jerome Allen, Ph. D., Dean of the School of Pedagogy in the University of the City of New York, is giving an interesting series of lectures to mothers. Two classes, representing some of the most thoughtful women of the city, have formed to hear these lectures. The classes go on from year to year. The last lecture listened to was on "The Education of the Sentiments." There are other mothers to be reached with pedagogic truth—mothers who need assistance in their thinking much more than these women do. There is a great field for missionary work to be done by teachers, among mothers who have not got to the point these women have reached of organizing classes and engaging a lecturer.

Editorial Correspondence. II.

The Florida Central and Peninsular Railroad runs from Jacksonville to Tampa, passing over one of the many wonderful things that cause Florida to stand out distinct from the rest of the states—a subterranean river that finds its outlet at Silver Spring. The term "spring" has no significance here; there is a volume of water fully equal to that of the Croton of New York. There are fissures in the rocks at a depth of about 80 feet,—in one place the mouth of a cave may be seen, 12 x 15 feet—and from these there pours day after day an unceasing flood of the most transparent water.

This water makes a "run," as it is called, though "river" is the proper name, of about ten miles in length, and there enters the Ocklawaha; this river, 200 miles in length, is the outlet of numerous lakes, and is one of the chief tributaries of the St. John's, entering it near Palatka. The Silver Spring itself is about 300 feet in diameter and is 80 feet deep; the run is from 150 to 300 feet wide and from 50 to 80 feet deep; the current runs at the rate of three miles per hour. The banks are mainly lined with cypress, palmetto, and ash trees. These trees extend back through low wet lands to the banks. The "run" is a tortuous river, winding in and out among the trees in a valley about two miles wide; the rest of the valley is a cypress swamp in which the alligator finds a congenial home.

The voyage from Silver Springs to the Ocklawaha was made in an "observation" boat on a bright and beautiful day; at times the boat was stopped at deep points where rifts in the floor of the stream could be seen; the colors of the rock and the vegetation were like those of the rainbow; fish lazily glided backward and forward below us; on the logs, on the bank, turtles were sunning themselves. At one point an alligator, probably twelve feet long, was seen; the moss was swaying in the light breeze giving a peculiarly mournful aspect to the scene. At one landing a party was taken aboard who brought a basket of oranges just picked from the trees, for behind the cypress trees forming a fringe to the run, there are orange groves.

The captain of the excursion boat explained that he had come to Florida allured by advertisements of cheap land at Silver Springs Park; he found, as many had, that while it is easy to purchase land at low prices in Florida it is not so easy to make a living on the land afterward. There will be many who will read these lines who have thought of coming to Florida; a few words of candor may not be wasted. During the past seven years I have made a careful study of Florida, and every year the conviction deepens that she has a great future; but she will develop slowly into her greatness. Her position among the sisterhood of states is more marked than that of any other. Florida is to be a winter home, a winter resort, a refuge when cold and ice make all the other states uncomfortable. Year by year it is becoming customary for numerous classes of people to spend here from one to three months. These are not necessarily the wealthy; there are farmers who have no winter work, for farming is carried on differently now from what it once was; there are young men looking for business openings and there are especially elderly men and women who have borne heavy burdens and now try to take life more leisurely.

Once Florida was resorted to by invalids almost wholly; they come here now, in earlier stages of diseased lungs, and it is easy to find testimony that numbers have been restored to health. Almost everywhere persons are found, appearing to be in excellent health, engaged in work of some kind, who owe all to the renovation there is in Florida winter sunshine. A vast volume could be written of those I have met here who have said, "I thought I might live a few years longer by coming and now I find myself comfortably off."

I can recommend the sunshine of this country from a personal experience. In 1886 I came here suffering from nervous prostration; I went into the Lake Worth region; put on my overcoat and sat day by day in an easy rocking chair that stood in the white sand at the end of the Cocoanut Hotel, letting the genial sun shine on me as strong as it would. One month of this showed a little improvement; another month of this treatment was taken at St. Augustine and Jacksonville; it was followed at

other points during the following summer. It was followed during the succeeding years; it is the plan adopted in 1893—when I am not writing letters or visiting schools.

To those who think of coming to Florida to settle, this advice is given: Get information of as definite a kind as you can. (1) You can write to A. O. MacDonell, Jacksonville, for such information, as he is there for that purpose and is a most genial gentleman. He will tell you as to lands and routes. (2) You should visit Florida before you come to settle; you will find many things here so unlike what they are at the North that disappointment is apt to be felt. The main purpose that must impel you must be the milder climate; if you do not feel that this compensates for the difference, then you will not be happy here.

I have just been conversing with a lady from Starke, coming here primarily to take care of a brother who was in a low condition resulting from hemorrhages of the lungs. He recovered and returned to the North; she fell in love with the climate and remains. She is very enthusiastic, tells of two acres of strawberries, of a hundred peach trees, of 500 orange trees and her delight in caring for them. As I sum up the products, she has an income of about \$1,800 a year.

This leads to the point that must be steadily borne in mind—it takes time to realize a money-producing orange, lemon, or peach grove. It takes from six to ten years for the grove to come into bearing. All of this time the owner must in some way support himself. How this can be done is a question for most sober inquiry. It is pretty plain that there must be some money left after the land is purchased and the trees planted. Again, I say, let the person who thinks of coming to Florida gain full information before he settles down.

I have met with many who have come here and have made a success, and would on no account go back; I have met too with those who have not been successful and who lay this to the soil, the climate, and claim they have been deluded. But the population is steadily increasing, the people are better off year by year; the houses look more comfortable, the school-houses especially look twice as cheerful. So that it is fair to infer that the future of Florida is a sure one.

As I write this letter I look on orange trees still holding their golden fruit, and also bearing blossoms whose fragrance steals into the open window. Fifty kinds of roses are in bloom; the myrtle and the fragrant bay line the paths; the air that is wafted from the gulf of Mexico is cool and delightful. This is Florida.

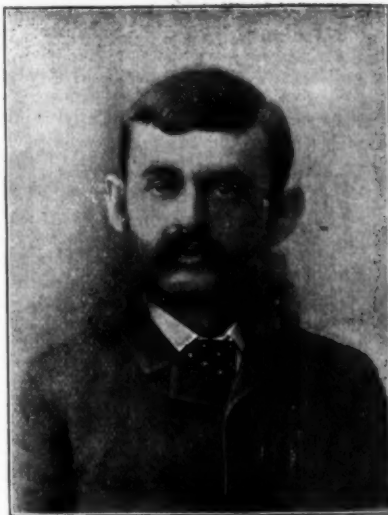
Tampa.

A. M. K.

Col. Parker has been re-elected to the principalship of the Cook Co. normal school at an advanced salary (\$5,000) per annum, almost without opposition. Some of his teachers, too, have had their salary increased. This, taken in connection with the recent generous appropriations for the school (a \$20,000 gymnasium has been thus provided for), does not make it appear that the recent attack on the school had an unhappy effect. Sometimes the most vicious attack but brings out the merits of a system and gains it fresh appreciation.

Probably all schools and teachers will be rejoiced that Mr. Cleveland has chosen for his secretary of agriculture, J. Sterling Morton, of Nebraska, who had more to do than any other person with the establishment of Arbor day. Mr. Morton said recently in regard to it: "I am proud of the part I played in originating Arbor day. Since it was established 40,000,000 trees have been planted in my state alone. The day is now observed in thirty-eight of the forty-four states. I trust every state in the Union will soon join hands in the cultivation and preservation of our trees."

Our respected and good-looking contemporary, THE NEW YORK SCHOOL JOURNAL, has transferred itself to its beautiful new building, 61 East 9th street, New York. We congratulate our brethren of THE SCHOOL JOURNAL on this substantial evidence of prosperity.—*Western School Journal*, Topeka, Kansas.



F. L. Shaw.

Among the young business men and women of Maine, Frank L. Shaw, principal of Shaw's business college, of Portland, is widely known. He was born in Portland, in 1857, and was educated in the public schools of that city and graduated from a business college there in August, 1878.

Immediately upon his graduation he accepted a position in the college as principal of the department of theory, and teacher of mathematics and book-keeping and held this position until 1884, proving himself a competent instructor and an exceedingly efficient, yet popular disciplinarian. He then resigned this position, and opened a business school of his own which has grown to be the largest east of Boston.

Mr. Shaw opened in October, 1884, with one student in his school. In 1892 the maximum attendance at the Shaw's business college was two hundred and twelve with an enrollment of three hundred and fifty students during the year. When it is known that fourteen years ago the then leading business college in Maine had a maximum attendance of but fifty students, it must be conceded that the educator who could in eight years, change an enrollment from one to two hundred and twelve students, must be an active, an aggressively earnest, and capable man, with true business instincts, and possessed of an enthusiasm, contact with which would be of inestimable value to young men and women.

Modern Language Systems.

Now and then we receive letters from teachers asking about the merits of the Gouin method. The gist of the method was given in THE JOURNAL of January 14, page 502. It is not a new discovery. The principles underlying it have been known and applied since Comenius published the *Gate of Languages Unlocked*, 260 years ago. The method which Basedow claimed to have discovered in 1749 was similar to (and in some respects more "natural" than) that of M. Gouin.

Mr. Stead, in a sensational article on "How to learn a language in six months," speaks of Gouin as of a modern Balboa who made a wonderful discovery. He reports that five pupils were taught by his "method" and after six months were able to read and understand ordinary French prose and could speak it fluently, though not with grammatical correctness. M. Bétis, a competent native French teacher, was their instructor. Ten hours a week were devoted to the study. Two of the pupils, aged nine and thirteen, had never known French before. This reminds us of Basedow's pupil at Borghorst who learned Latin in even less time. The other pupils of M. Bétis were, according to the *London Journal of Education*, gifted with very unusual powers of memory and, besides, had studied French for four years previously with a private teacher. Hence the result of the experiment is not surprising.

The point we wish to make is, that we need not look to Europe for so-called "new methods" of teaching languages. The systems worked out and employed by the Berlitz school of languages, Th. Heness, Dr. Sauveur, Dr. Worman, and other eminent teachers of language, in this country, are far better than those followed in Europe at the present time. The educational leaders on the other side of the Atlantic are beginning to recognize this fact and are looking to the United States for rational systems of linguistic training.

Supt. L. C. Wooster has prepared charts showing some interesting statistics of the educational work in Kansas. The number of children enrolled in the elementary schools of the state last year was 393,818. 209,217 boys and 193,170 girls; in the secondary schools were 14,137 children. 6,469 boys and 7,668 girls; the pupils in superior schools numbered 2,469—1,100 boys and 1,369 girls.

(This shows that less than one in 27 of those who visited the elementary schools entered the secondary schools, and only one in 113 continued till he reached the superior schools. Moreover, in the elementary schools the number of boys exceeded the number of girls by 16,047, while in the secondary schools were 1,199, and in the superior schools 269 more girls than boys.)

The total number of teachers employed in the state last year was 12,680, of whom 4,666 were male teachers and 8,014 female. Of these 11,939 were employed in the elementary schools, 4,248 male and 7,691 female. In the secondary schools, 559 teachers were given employment, 279 men and 280 women. 182 teachers were engaged in the superior schools, of whom 149 were men and 43 women. The average salary of the men teachers was \$42.15, and of the women \$35.42. The average length of their service was 3.6 years. Eighty-five colored teachers were employed in the elementary schools, 38 men and 47 women.

The Decatur *Beacon*, Decaturville, Tenn., writes:

"No teacher should try to get along without some educational paper. If you will read a good paper or a good book, that is devoted to the advancement of education, you will greatly increase your power for doing good. Some excellent books and journals are published by E. L. Kellogg & Co., New York."

The American Library Association, which has the co-operation of nearly all the great libraries of the country, will make a notable exhibit at the World's fair. It will include samples, models, and photographs, showing articles and mechanical devices in actual use; printed matter, forms, blanks, constitutions, by-laws, rules for subscribers; accession departments and their management; catalogue, classification and reference departments; binding department, with samples of binding, temporary covers and recipes for restoring, mending, and cleaning; shelf and building departments, and an architectural exhibit showing plans, elevations, perspectives and models of the best library buildings. There will also be a model library of 5,000 volumes, selected from lists prepared and sent in by the various librarians of the country.

A number of years ago New Bedford, Mass., abolished written examinations for promotion in the primary and grammar schools. The plan worked so well that it was extended last fall to include the high school. It is interesting to hear the testimony of Supt. William E. Hatch, regarding the working of the system. In a letter to the Boston *Commonwealth*, he says: "The condition of things that those who insist on examinations for promotion have always predicted in case the examinations were abolished has not occurred in our schools. The pupils work as well without examinations and the schools are as efficient as in other cities where examinations exist."

Going further into details, Mr. Hatch says: "The teachers have no excuse for rote teaching when examinations for promotion do not exist, neither do they have any excuse for cramming their pupils with stereotyped questions. They are free to study the children themselves and to develop their thinking powers, being required only to cover each in her own way (provided her teaching is based on sound educational principles) the required course of study. Examinations for promotion were abolished in the lower schools seven or eight years ago at least, so we have had time to judge of the merits or defects of the plan. The plan was introduced in the high school at the beginning of this school year. I learn from talks with several of the teachers there that there is no visible loss of interest or effort on the part of the pupils so far, nor do I think there will be. To sum up: After a number of years of trial of the plan of basing promotions on the recommendations of the teachers, rather than on examinations, we consider it an unqualified success. There is no desire on the part of any to return to the old plan, and we consider that to do so would be a decided step backward."

When the kindergarten bills came up in the Colorado assembly, many friends of the measures were inclined to believe them unconstitutional, as the law provides for the education of children from the age of 6 to 21 only. They were therefore referred to the supreme court. If that tribunal affirms their constitutionality, all obstacles will be removed, and it is expected that the bills will pass without opposition.

President MacAlister of the Drexel Institute, Philadelphia, recently delivered an address before the New England Conference of

Educational Workers, on "The Independence of the Kindergarten and the Common Schools." His idea that the calling and considering the Philadelphia kindergartens sub-primary schools had worked to the advantage of the system called out a lively discussion. The majority of the educators present did not agree with the speaker. It was claimed that this would tend to destroy the true basis of the kindergarten, and to substitute the formal lessons of the primary school instead. The plan of Miss Foster, a kindergartner, was more favorably received. She argued that the proper method of spanning the bridge between the kindergarten and the primary schools was to have the teachers of the last named schools also thoroughly trained in kindergarten methods, which would enable them to lead the young mind successfully from one system to the other.

St. Louis is celebrating the twentieth anniversary of the introduction of the kindergarten in the public school system of the city and the opening of the public library in its new quarters in the board of education building. The following is the program:

FEB. 18: Address of Welcome, Mr. F. M. Crunden, librarian; Paper by U. S. Commissioner Dr. Harris; "Universality of Kindergarten Principles," Supt. E. H. Long, of St. Louis; "The Relation of the 'Divine Comedy' to Education," Mr. Geo. P. Brown, editor of the *Public School Journal*, Bloomington, Ill.

FEB. 20: "The Story of Dante's 'Inferno,'" Dr. F. Louis Soldan.

FEB. 21: "Dante's Purgatorio," Mr. Denton J. Snider.

FEB. 22: "Relation of the Kindergarten to Great Literature," Mr. Denton J. Snider.

FEB. 23: "The Symbolism of Dante," Mrs. J. C. Learned; Addresses on the Kindergarten, by Messrs. McClain, Murphy, Frost, Kent, Nagel, and Wolfe, of St. Louis.

FEB. 24: "Some Modern Lessons from Dante," Mr. Hamilton W. Mabie, of the New York Kindergarten Association.

FEB. 25: "Creative Element in Life," Mr. Hamilton W. Mabie.

The assistant teachers of Jersey City, feeling that the "regular" association had settled into too much of a humdrum, have formed a new association called the Jersey City Teachers' Club. Mr. W. J. Eckhoff is the president, and Mr. James T. Mackay and Miss M. Dugan have been elected secretaries. It had been observed for some years that all the officers of the "regular" association were principals and there was nothing left for the rank and file to do but look on. The new association has appointed its board of control of twelve from the "ranks." It is going into sciences and school work of all kinds. The older association feels "shuck up" and is also announcing lectures for teachers in various sciences.

The president of the High School Board, Toronto, Canada, is a woman. Mrs. D. O'Connor is the first woman so far as we know, who has held this honorable position anywhere.

The Madison County Teachers' Association met at Oneida, N. Y., Feb. 18, 1893. The following subjects were discussed:

"How shall we teach Current Topics?"

"Should our teachers' institute be graded?"

"How may our pupils be stimulated to independent study and thinking?"

Discipline—Its purpose, and methods.

"How may we secure the co-operation of the parents?"

"Should the amount of the district 'Quota' be graded according to the certificate held by the teacher?"

"Shall we send delegates to the State Teachers' Association?"

"What are the most important needs of our schools?"

Some time ago the Pope Manufacturing Co., of Boston, Mass., offered a prize of a bicycle to any teacher who would first inform them of any misstatement of fact in any school book studied in this country under the authority of any school committee. It is not strange that errors were found in many of the best of them. Prizes were awarded to six teachers. The result of the contest has been published by the Pope Company in a pamphlet of twenty-four pages.

Educational Association Meetings.

FEB. 21-23.—Department of Superintendence, N. E. A.—Boston, Mass.

MARCH 9-10.—Superintendents' Round Table—Greenville, Pa.

MARCH 21-24.—Pedagogical Section, Florida State Teachers' Association—De Funiak Springs.

MARCH 31.—Central Illinois Association—Monmouth.

JULY 25-28.—Educational Congress at the World's Fair.

Through Parlor Car Express to Atlantic City via Pennsylvania Railroad.

The New York and Atlantic City Through Express via the Pennsylvania Railroad was placed in service on the 10th inst. This train is composed of Pullman buffet parlor cars of the latest design and the standard passenger coaches of the Pennsylvania Railroad, and affords a most comfortable means of reaching the popular "City by the Sea." The train leaves New York, stations foot of Cortlandt and Desbrosses streets, at 5.35 P. M. week-days and arrives at Atlantic City, without change, at 5.35 P. M. Returning, it will leave Atlantic City 8.55 A. M. week-days and arrives in New York 12.43 P. M.

This arrangement affords excellent connections to and from New England, Eastern, Central and Western New York State.

The question of secular against religious instruction is just now being agitated in Canada, and is likely to prove much more troublesome there than in the states, particularly in the more recently opened settlements in the Northwest. Two years ago separate Roman Catholic schools were abolished by the provincial legislature. The archbishop of Manitoba has issued a circular in which he repudiates the idea of purely secular education and repeats that the church "prescribes the necessity of religious instruction in the schools." By way of escaping the consequences of the action of Archbishop Satolli, he declares that the legal status of the Catholic, in Canada, particularly Lower Canada, is entirely different from that in the states. He does not favor anything in the nature of a compromise and seems to demand the extreme measure of Catholic schools supported by the province. If the jurisdiction of the Papal delegate includes Canada, a solution of the difficulty may be looked for in the near future, for the excitement is leading to dangerous extremes in Manitoba.

Associate Superintendent Ward recently addressed the Brooklyn teachers on the subject of "Teaching Beginners How to Read." He spoke in substance as follows:

"The old alphabetic method is slow and clumsy, the phonetic incomplete. The combined method is the better one. In this we use words, syllables, and sounds. There are three simple steps: First, ear training; second, eye training; third, the simultaneous use of the eye and ear in reading words and sentences. Teach, first, words as wholes; second, syllables as wholes; third, single sounds of the words to be employed. A number of tests in different schools prove this method to be superior to all former schemes. Teaching an initial stock of sounds should not occupy the teacher's attention."

The teachers of New Orleans are making an effort to have the meeting of the N. E. A. held in their city during the carnival season of 1894.

The state of Ohio has now a law to include physical culture in the curriculum of the public schools "of the first and second class."

Massachusetts, according to the report of the state board of education, spent more than \$9,000,000 last year for public schools.

Six schools have been ordered to be closed in Milwaukee on account of their unsanitary condition. Five thousand children will be deprived of schooling for an indefinite period.

Prof. L. B. Corey, a normal school graduate and one who always took a lively interest in everything connected with the profession of teaching, died in New York Feb. 14. His funeral took place from the corner of Bowery and Broome street on the following Friday.

Suggestions to Teachers.

CONCERNING DISCIPLINE.

(Supt. Mowry, of the Salem, Mass., schools has issued cards to his teachers which contain some very excellent practical suggestions respecting school government and methods. The following is a sample:)

1. Prevention of the wrong doing is better than punishing the wrong done.
2. Never charge a pupil with a misdemeanor on mere suspicion, never at all unless you have positive proof, an absolute demonstration, that he is the guilty one.
3. Exercise great care in taking a stand that you may have no occasion to retreat.
4. Fault-finding is not calculated to cure a fault.
5. Distrust in the teacher breeds deceit in the pupil. Therefore always trust your pupils.
6. Absolute self-control on the part of the teacher is a necessary prerequisite to proper control of the pupils.
7. Obedience won is far better and easier than obedience compelled.
8. A child properly employed is easily controlled.
9. A school not properly controlled is a school of little progress or profit.
10. Never threaten; never chide angrily; above all, never use, in the least degree or under any circumstances, SARCASM.

The *Wayne Independent*, Honesdale, Pa., writes:

"We would call the attention of the county committee who are to arrange a course of reading for the teachers, to EDUCATIONAL FOUNDATIONS, published by E. L. Kellogg & Co., of New York. It is the best journal for a reading course published. It treats all departments in the educational line. The two principal departments are professional and informational. Under the first history, educational philosophy, methods, and educational civics are treated, and under the latter are found the editorials and matters of information concerning the branches taught. Every teacher should study this magazine."

Correspondence.

To the Editor of THE SCHOOL JOURNAL:—"I would like to prevent other teachers from making my mistakes," said a bright teacher to me recently. "My first mistake was to butt against a stone wall—said wall being the superintendent of schools where I was teaching. He was a tyrant, as proud as a czar, with old foggy ideas on every subject which he would have carried out in the school-room. When he asked me to have my pupils recite on a chalked line in front of my desk, I made a grimace at him and shrugged my shoulders. Forthwith, I was discharged. The moral's plain: don't break your own head for the sake of your pupils' toes—and after all there are worse things for boys and girls than standing on a chalked line. Policy, policy! We must learn it soon or late, and if a thing were well when done it were well done quickly."

Mistake No. 2 was to talk about my own affairs, air my own opinions and criticise freely. People naturally disliked me. I grew unpopular.

Mistake No. 3 was to assert boldly in the face of an enraged father that I would treat his son just as I saw fit in the school-room, and would take no instruction from parents.

Well, one day I sat down to think over my non-success, and at the end of my thinking I made solemn vows:

- 1st. To get around or over stone walls.
- 2d. To win the co-operation of parents in my behalf.
- 3d. To mind my own business and let other people's alone. By keeping these vows I became—not a bright and shining star, but a respected teacher, and perhaps I'll shine yet. Who knows? 'Tis the unexpected, etc."

LUCY AGNES HAYES.

Please state what is the main objection to the coining of silver dollars.
New York. M. E. G.

Up to October of last year silver declined from 112½ to 95½ cents per ounce. There is evidence that points to a further decline in the value of this metal. India has absorbed more silver in recent years than she can digest, as is shown by the great decline in the exports of silver from England to India during 1891 as compared with 1890. China does not absorb as she once did. Austria proposes to discontinue the issue of her silver florins and to introduce the single gold standard. France, though bimetallic, uses gold in her colonies. Germany is liable to sell at any day a large amount of silver she has on hand. The improved methods of mining and smelting causes the world's product of silver to increase in a very rapid ratio. So that when the United States ceases to purchase and hoard up silver, as at some time it will, then silver will go down. The loss to the United States by the decline in the market value of its hoard of silver between July 14, 1890, and October 14, 1891, was at least \$5,000,000. The danger of loss is therefore the main objection.

What is the weight of the carat?

E. P.

In 1877 the weight of the carat was fixed by an international syndicate of London, Paris, and Amsterdam jewelers at 205 milligrammes, or 151.76 carats to the Troy ounce so that the French carat is equal to about three and one-sixth Troy grains (3.168168+). The French crown jewels were sold by this carat. But the English carat is a little larger; 151½ English carats are equal to a Troy ounce, that is 3.1683+ Troy grains. There is no law regulating the size of the carat.

Will you please explain what is meant by the International Date Line?

C. F. S.

At every instant of time it is sunrise at some line on the globe. In traveling eastward, then, you are approaching the sunrise and in order to have your watch keep correct sun time you would have to set it ahead one hour for every fifteen degrees of longitude passed over. In going eastward all the way around you would have to set it ahead twenty-four hours. So in going westward you would have to set your watch back in order to keep it correct with the sun. Traveling eastward around the globe you gain a day; traveling westward you lose a day, and in order to prevent confusion a line has been fixed called the International Date Line. This is in the Pacific ocean very near to the 180th degree of longitude. When ships sailing westward reach this line they drop a day; for instance, if it is Monday when they reach the line the captain will say, "Take notice, it is now Tuesday." On returning they will gain a day.

Who uttered the sentence "All is lost save honor"?

E. B.

Francis I. of France in 1525 sustained a crushing defeat in a battle with the Emperor Charles; it was at Pavia in Italy. He was wounded and taken prisoner. In his letter to his mother he used the expression quoted.

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New Books.

The American Science series is intended to supply the lack of authoritative books whose principles are, so far as practicable, illustrated by familiar American facts; also text-books that do not contradict the latest generalizations. One of the most important of the books in this series is *Physics—Advanced Course*, by Prof. George F. Barker, of the University of Pennsylvania. The classification adopted in this work is based on the most recent views of energy, considered as being ultimately a phenomenon of the æther. At present, all physical phenomena seem capable of satisfactory discussion under the heads of mass-physics, molecule-physics, and æther-physics. The introductory portion of the book considers, first, physical relations in general, and second, the law of motion; the latter being discussed, first in the abstract, and second with reference to the action of force on matter. Under mass-physics energy is first treated of as a mass-condition, and then work, as being done wherever energy is transferred or transformed; the subject of potential being developed as a consequence of mass attraction. Thus the properties of matter are considered and also the modern views of its structure. Sound is considered as a mass-vibration. Only heat is treated under molecular physics. Under æther physics are grouped: (1) æther-vibration or radiation, (2) æther-stress or electrostatics; (3) æther vortices or magnetism, and (4) æther-flow or electrokinetics. The mathematics employed is such as students in the higher institutions of learning are supposed to be acquainted with. While the aim, on the one hand, has not been to make it a great collection of facts, the author has avoided, on the other, making it merely a discussion of abstract theories. The metric system has been employed throughout the volumes. The book is an exhaustive treatment of the subject, in the light of recent research and will prove especially valuable as a text-book where more than an elementary knowledge of the subject is desired. (Henry Holt & Co., New York.)

It is useless to decry all speculation as "philosophic moonshine," when we know that ideas are the most substantial things in the world and that it is chiefly by reason of the problems worked out by the philosophers that science has been enabled to make progress. Those who would lay a foundation for an understanding of the "science of sciences" should read *First Steps in Philosophy*, by William M. Salter. In this book he considers matter and duty, giving the result of his own researches in as clear and simple a manner as the subject will admit. To be sure this is no more than an introduction to philosophy proper, but one who gets a clear idea of these will at least have made a fair start. The author is a close reasoner and a careful perusal of the book cannot but act as a healthy stimulus to the mind, whether one agrees with the conclusions reached by him or not. (Chas. H. Kerr & Co., Chicago. \$1.00.)

The changes that the government of France has undergone during the present century renders its history during that period one of intense interest. Many of these changes are so recent, and have had so much effect on European politics, that the history of these events will be read with avidity by all who take an interest in the progress of the world. The volume entitled *France in the Nineteenth Century, 1830-1890*, by Elizabeth Wormeley Latimer, is therefore sure to meet with a warm welcome, and the attractive style in which it is written will win for it a wide popularity. The author draws her material from all available sources—newspapers, books, documents, etc., and

weaves it together with skill and judgment. The personal history concerning the people who have been prominent during the century, particularly Charles X., Louis Philippe, Louis Napoleon, Empress Eugenie, Maximilian, Thiers, Boulanger, and others adds greatly to the interest. The volume has an excellent half-



EMPEROR MAXIMILIAN.

From "France in the Nineteenth Century." (A. C. McClurg & Co.)

tone frontispiece portrait of Emperor Napoleon I., besides portraits of Charles X., Louis Philippe, Duchess de Berry, Lamartine, Empress Eugenie, Maximilian, Napoleon III., Jules Favre, Thiers, Gambetta, Presidents Grevy and Carnot, and other celebrities. It is well printed and bound in blue cloth with lettering in gold. (A. C. McClurg & Co., Chicago.)

The great popularity and usefulness of *Industrial Drawing: a Manual for Carpenters and other Woodworkers*, by W. F. Decker, has led to the publication of a second edition greatly

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Spear's Leaves and Flowers

By Miss M. A. SPEARS, late Principal of Model School, State Normal School, West Chester, Pa. Price, 25 cents.

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D. C. HEATH & CO., Publishers, Boston, New York, Chicago, London.

revised and improved. The author's increased knowledge and experience have enabled him to prepare a book much more complete than the former edition. He shows how to make a rough sketch, describes drawing instruments and materials, tells how lettering should be done, furnishes geometrical problems and further on directions for elementary projections and application of projections with special reference to timber joints, roof trusses, brackets, windows, etc. Then there is a chapter on isometrical and cabinet projections, embracing the carrying out of details. Directions are given for drawing house plans from the foundations, floor plans, etc., to the elevations, framing, and roofing. We have only mentioned a portion of the contents of this very complete and excellent manual. In addition to the illustrations in the text there are twenty-six full-page plates; these and the large, clear type and tasty binding make it a very attractive volume. The author is instructor in drawing in the University of Minnesota. (William T. Comstock, New York. \$1.50.)

The *First French Cumulative Reader*, by Adolphe Dreyspring, Ph. D., is intended to follow the same author's *Easy Lessons in French*. The name indicates to a certain extent the plan and method. In the first book the young pupil meets with a certain number of words; in this those words occur and others are added to the list which are easily translated by the help of the vocabulary at the end. The story is full of incident and therefore interesting, while the youthful imagination is assisted by numerous appropriate illustrations. One of the designs of the story is to bring out prominent grammatical features, such as different classes of verbs, force and value of prepositions, use of adjectives, syntactical features, and enough of idiomatic expressions to pave the way for a more natural flow of language. The repetitions are frequently and purposely made so as to impress the words and forms of expression on the memory. For riper students who are ready to appreciate a theoretical presentation of the language, a supplement of grammatical references, schemes of declensions, paradigms of regular verbs and a synopsis of all irregular, defective, and impersonal ones contained in the story, has been added. (American Book Co., New York, Cincinnati, and Chicago. 75 cents.)

Wordsworth's *White Doe of Rylstone* is issued in a small volume, with introduction and notes, by William Knight, of the University of St. Andrews. The poem was composed in the summer of 1807, during a visit to the beautiful scenery surrounding Bolton priory, in Yorkshire, and is founded on a tradition connected with that place. There are faults in the plan, but all who have a genuine taste for poetry will appreciate the many beautiful passages in the poem and its spiritual significance. Many of the earlier readings are given in the notes. The same volume also contains *The Force of Prayer* and *Song at the Feast of Brougham Castle*. (Macmillan & Co., New York. 60 cents.)

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Important Events, &c.

Selected from OUR TIMES, published by E. L. Kellogg & Co.; price, 50c. a year.

News Summary.

FEB. 5.—A petard exploded near a Protestant meeting in Madrid. —No signs of a rebellion in Cairo.

FEB. 6.—A wheat-tax insurrection put down in Argentina. —Waters receding after the great and destructive flood at Brisbane, Australia.

FEB. 7.—The Ottawa parliament has a lively day discussing political union with the United States.

FEB. 8.—American capitalists acquire the right to collect the customs duties of San Domingo, and they intend to administer affairs so that the Republic will become prosperous again.

FEB. 9.—Ferdinand de Lesseps and his son, Charles, each sentenced to five years' imprisonment and to pay a fine of \$600; M. Eiffel was sentenced to two years.

FEB. 10.—Mgr. Satolli ordered Bishop Wigger, of the Newark diocese, to abrogate a rule by which Catholic parents who sent their children to public schools were refused the sacraments of the Church.

FEB. 12.—Death of Dr. Norvin Green, president of the Western Union Telegraph Company. —The island of Zante continues to be shaken by earthquakes.

FEB. 13.—Opening of the Mardi Gras festival in New Orleans. —American delegates to the Brussels monetary conference preparing a report of the proceedings.

FEB. 14.—Secretary Foster approves of minister Stevens' course in Hawaii.

FEB. 15.—The cholera has disappeared from Marseilles. —Dr. Huntington, of New York, proposed for bishop of Massachusetts.

Columbian Exhibition Notes.

The Venezuela building will be a handsome one-story edifice of white marble in the Græco-Roman style. There will be three towers. On the left will be a life-size statue of Columbus, and on the right another of Bolivar, the liberator of South America. One feature of this unique building will be a number of neat gardens completely encircling the edifice and containing the rarest and most beautiful plants and orchids for which Venezuela is celebrated the world over.

One of the most novel exhibitions in the Mines building will be an obelisk of coal sixty feet high, which is now being mined, as indicative of the chief industry of Pennsylvania. In the Agricultural building work will soon commence on a reproduction of the famous old liberty bell of Philadelphia.

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One of the most interesting exhibits of the fair will be shown in the New York building. This will be wax figures dressed in costumes from the Indian maiden and the time of the Puritan fathers down to the present day.

Louisiana will display in her exhibit a large collection of forest woods, and add many valuable specimens to the forestry building.

The women of North Dakota have arranged a novel exhibit for the state building. This consists of the cart in which the first settler of the country brought his bride to Pembina.

THE NICARAGUA CANAL BILL.

The bill for the United States to guarantee the payment by the Nicaragua Canal Company of \$100,000,000, with interest, in sixty years, was lately discussed in the United States senate. In speaking in favor of the bill, Senator Frye said: "Nicaragua has been the favored location for a great many years on account of its climate; because the distance for an excavated canal was only 26 miles, while lake and river transportation was 149 miles; because midway was a magnificent sheet of fresh water, deep enough and broad enough to hold the navies of the whole world; because at either extremity a harbor, safe and convenient, could be easily provided, and because it is just beyond what is known as the 'calm belt' of Panama." The treasury of the United States will be amply secured by mortgage.

THE ANTI-OPTION BILL.

The anti-option bill, which passed the U. S. senate recently, forbids the selling of grain, cotton, pork, and other products for future delivery. The seller must have the property in hand. The bill was designed to reach sales made without intention of delivery; it really goes much farther, and forbids all sales for the future, whatever the intention. It is therefore considered a dangerous measure, as it would hamper trade.

THEY WANT GOOD ROADS.

The American League for Good Roads held a meeting in Washington recently. One object of the league is to influence legislatures to pass desirable laws relating to roads. It has been shown that the expense of making good roads is repaid by the lessened wear on vehicles and teams. In some parts of the country the roads are so poor that it takes twenty-five per cent. of what the grain brings to get it to market. A road exhibit at the World's fair is contemplated, and an appropriation from government has been asked for.

AN ECLIPSE OF THE SUN.

The English and French are making great preparations for observations of the eclipse of the sun, which will be visible in Africa and South America. One English expedition will start for Africa arriving at Bathurst on April 2, just a fortnight before the eclipse comes off. Another one will go to Pernambuco in Brazil. The French will send an expedition to Joel, Africa, and Harvard college, one to Chile. This eclipse will be one of the longest and most important of the century.

A NATIONAL QUARANTINE LAW.

On February 15, President Harrison signed the national quarantine bill, which was considered necessary as a protection against cholera. Under this law arrangements will be made, on both sides of the Atlantic, for a strict guard against the introduction of cholera next summer.

Science and Industry.

THE POWER OF ELECTRICITY.—A miniature thunder factory has been constructed for the science and art department at South Kensington, Eng., with plates seven feet in diameter, which, it is believed, would give sparks thirty inches long, but no Leyden jars have been found to stand its charge, all being pierced by the enormous tension.

DISTANCE TO THE SUN.—German astronomers by computations from the transits of Venus of 1874 and 1883 have found the sun's parallax to be 8.880 seconds. This simply means that half the diameter of the earth, as seen from the sun, would subtend an angle of 8 seconds and 880-1000ths of a second. The distance of the sun, as indicated by the parallax given above, would be 92,069,750 miles. There may be an error of one-four-hundredth part either way, making the distance that much greater or less than the above number.

UNDERGROUND ELECTRIC ROADS.—The London underground electric road has proved a success. There is also an underground electric road in this country—a tunnel four and a half miles long under the city of Baltimore—but this is used for freight alone, the motors hauling forty loaded cars at a speed of thirty-six miles an hour.

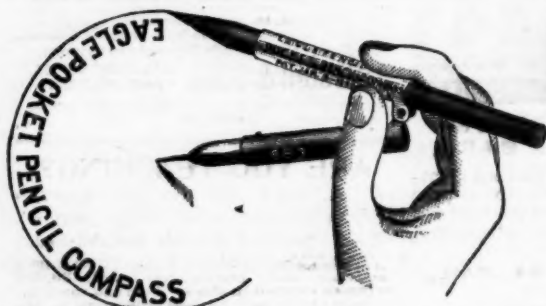
NICKEL STEEL.—The manufacture of armor plate of nickel steel, and the treatment of it by the Harvey process, and by oil tempering, has resulted in a product so tough that it is very difficult to tool it. A rail made of this kind of steel would be practically indestructible.

FALL OF A METEOR.—A meteor fourteen inches in circumference fell into the street, with a rushing sound near Albany, Ore., recently. It was very hot, and charred the board upon which it was placed. The stone had the appearance of a volcanic production.

LONG DISTANCE TELEPHONE.—The telephone line between New York and Chicago is twice as long as any heretofore in use. The instruments used on it are so perfect that even a whisper can be successfully transmitted across the 950 miles.

ALUMINUM SHOES FOR HORSES.—Russia has tried an experiment with aluminum shoes for cavalry horses. A few horses in the Finland dragoons were shod with one aluminum shoe and three iron shoes each, the former being on the fore foot in some cases and on the hind foot in others. The experiments lasted six weeks, and showed that the aluminum shoes lasted longer and preserved the foot better than the iron ones.

PARIS TO HAVE A BIG TELESCOPE.—It is proposed to construct the largest telescope ever known for the next Paris exposition, which will be held in 1900. The telescope is to be on the reflecting principle, a mirror instead of a lens being employed to converge the rays of light to a focus. This concave mirror will be made of silvered glass and will have the colossal diameter of nine feet ten inches. It will be mounted at the bottom of a big tube having a length of 132 feet, which is more than double the length of any existing telescope. The largest telescope hitherto made is the Rosse telescope at Birr castle, Ireland, which has a reflector six feet in diameter and a tube sixty feet long. The Lick telescope belongs to the refracting class, the lens having a diameter of three feet.



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The following letter needs no explanation:

NEW YORK, Feb. 16, 1893.

MESSRS. LAWTON & COMPANY,
20 Vesey St., New York.

DEAR SIR:—The Simplex Printer came through in good condition. To say that I am delighted with it would be a very mild statement. It far surpasses anything of the kind I had ever examined. As a teachers' aid it is invaluable. Yours very truly,
JOHN DAVIS.

A great work is in progress in the establishment of school libraries in different parts of the country. Educators look upon this as one of the most important educational movements of the time. The country has the H. Parmelee Library Co., Des Moines, Iowa, to thank for much of this work. In their eighth annual catalogue 2,000 volumes in special library binding are listed; 30,000 volumes are carried in stock. Their plan and the character of their books are endorsed by the best educators in the country. Persons who are not teaching can secure employment with them establishing school libraries. Write for catalogue and terms.

There is no doubt many positions are open to teachers at all seasons of the year. Those who wish to test the truth of this statement should address the Albany Teachers' Agency, H. P. French, manager, 24 State street, Albany, N. Y. They have frequent calls for good teachers with good records. During the year they have secured over one

hundred positions in New York state alone. Send stamp for application form.

We have again been reminded by the occurrence of another holiday (Washington's birthday) that the mission of the public school is to teach patriotism. The school that does not have a flag flying, especially on extra occasions, is hardly considered up to the time. Bunting flags, silk flags, flags of all nations, cotton flags, etc., may be obtained of the Consolidated Fireworks Co., of America, Nos. 9 and 11 and No. 12 Park Place, New York. Send for their illustrated catalogue.

Prof. George S. Palmer, of Harvard college, says of Dole's *American Citizen*: "An admirable piece of work and, as far as I know, nothing of the sort exists anywhere. The author has made the matter as simple as it safely can be, clear too, and constantly attractive." This admirable book is intended as a text-book on civics and morals or as supplementary reading for grammar and high schools. Another book that may be used for supplementary reading, or as a text-book is Miss Spear's *Leaves and Flowers*. Those teaching elementary botany will find this suitable to their needs. Information concerning these books may be had by addressing D. C. Heath & Co., Boston, New York, Chicago, and London.

Those who are seeing the sights of New York city, and also those who are looking for bargains, will scarcely fail to visit the store of James McCreery & Co., Broadway and 11th street. Their annual clearing sale of cloaks, newmarkets, jackets, capes, and suits commences this week. These goods will be shown on separate counters and marked in plain figures to close out the entire stock to make room for spring goods. Elegant imported wraps from \$25 to \$125, formerly \$50. to \$300. The balance of their imported costumes are marked at less than one half the cost of importation.

Poets' No. *Vick's Floral Guide* for 1893 is a perfect gem of art. On the front cover is a colored illustration of Begonia, and on the back a delicately tinted drawing of the new Alpine Aster, and the whole is so made as to show parts of a ship, with its sailors at work, and the captain on the bridge,

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One thing that marks the last quarter of the nineteenth century is the fact that foods are put up in a more palatable form than usually. The fine flour that is made into bread is deprived of much of its most nutritive property. This is not so, however, with Wheatena, prepared by the Health Food Co., 61 Fifth avenue, New York. It is nourishing palatable, easily cooked, and easily digested. All grocers sell it. Free pamphlets will be mailed to all applicants.

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Magazines.

—The *Phrenological Journal and Science of Health* appears with a new and handsome cover design. The February number is a very interesting one. It has biographical sketches and portraits (half-tone and wood-cut) of Pres. Diaz, Samuel J. Tilden, Wm. M. Everts, Dr. McGlynn, and Chauncey M. Depew. There is also a valuable illustrated article on "The Head and Face and What they Indicate," by Nelson Sizer.

—The subject of "Artesian Waters in the Arid Region" is treated by Robert T. Hill in the *March Popular Science Monthly*. Mr. Hill corrects some erroneous notions that have prevailed concerning artesian wells, and explains in what situations borings are most likely to be successful. The article is fully illustrated. "The Decrease of Rural Population" is discussed, by John C. Rose, who gives full and exact information concerning this tendency, and points out the industrial changes to which it is due. An interesting and little-known topic in colonial history is dealt with by Colonel A. B. Ellis, under the title "White Slaves and Bond Servants in the Plantations." This is the selling of rebellious subjects of the British crown into servitude in the colonies of North America and the West Indies.

—The *Review of Reviews* for February appeals with uncommon force to men of action and men of affairs in the large and small cities of the United States. It is full of timely discussion upon such questions as the municipal ownership of gas and electric lighting works, the problems of city transit and administration, the gifts of millionaires for public purposes in their respective home cities, and such practical questions as the inheritance tax.

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
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